NP-3825/3325

SERVICE MANUAL

[for 115V]

REVISION 1

Canon

JUNE 1989

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INTRODUCTION

This SERVICE MANUAL is intended to provide basic information for servicing the plain paper copying machine NP-3825/3325 rendered to maintain its quality and performance in the field.

The NP-3825/3325 is designed to allow full automation of copy work and, to this end, accommodates the following system equipment.

1. MS5, Sorter VIII, Staple Sorter
2. D-ADF, D-ADF Editor, Editor
3. Paper Deck, Cassette Feeding Unit
4. Control Card V

Separate SERVICE MANUALs are made available for the MS5, Sorter VIII, Staple Sorter, D-ADF, D-ADF Editor, and Control Card V, and the discussions in this manual are limited to the NP-3825/3325, Editor, and Cassette Feeding Unit. The discussions, further, are based on the NP-3825 with descriptions of the NP-3325 as necessary.

In CHAPTER 1 "GENERAL DESCRIPTION," a brief description of the NP-3825's features, a table of its specifications, diagrams of its parts, and a discussion of its operation are given.

CHAPTER 2 "COPYING PROCESS" deals with the inner workings of the NP-3825 that are related to the generation of copies.

CHAPTER 3 "OPERATIONS AND TIMING" discusses how NP-3825's electrical and mechanical systems are related to each other with respect to functions and timing of operations.

In CHAPTER 4 "MECHANICAL SYSTEM," the NP-3825's mechanical system is discussed in relation to its operation, disassembly, reassembly, and adjustment.

CHAPTER 5 "INSTALLATION" gives step-by-step instructions for installing the NP-3825 together with items of inspection to be performed for each step.

CHAPTER 6 "MAINTENANCE AND SERVICING" contains tables of replacement parts and consumables and maintenance items.

Notes to keep in mind, as well as items of inspection and adjustment, are all found in the separately prepared SERVICE HANDBOOK with measures for defective images and problem operations.

In addition to the above chapters, a set of appendixes are provided for electrical information consisting of a general timing chart and general circuit diagrams. Troubleshooting information is contained in the SERVICE HANDBOOK.

The contents of this manual may be updated from time to time to reflect improvements rendered to the product; a Service Information Bulletin will be issued as necessary to cover such changes.

All servicemen are expected to be thoroughly familiar with the information contained in this manual and the SERVICE MANUAL, as well as Service Information Bulletins, for quick response to the user's needs.

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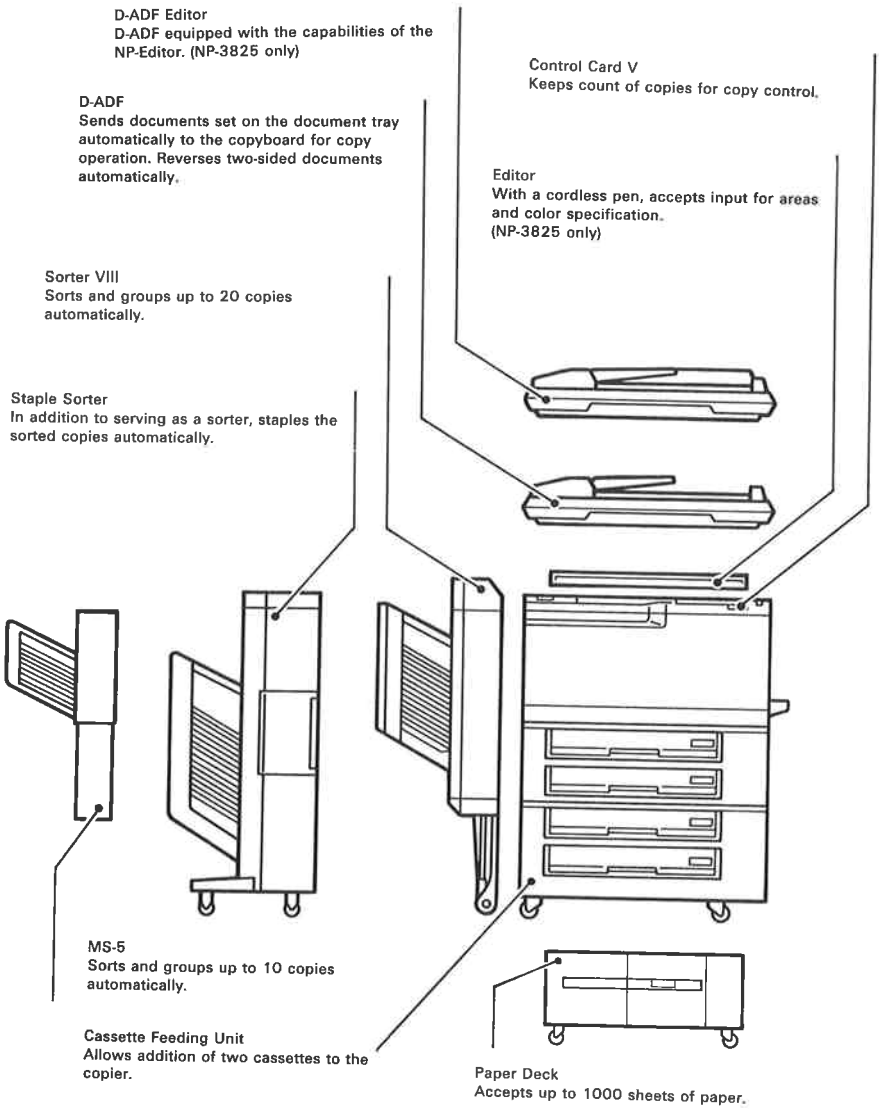
System Construction

When used together with its options, the NP-3825/3325 enables construction of a fully automated copying system.


D-ADF Editor
D-ADF equipped with the capabilities of the NP-Editor. (NP-3825 only)
Control Card V
Keeps count of copies for copy control.
D-ADF
Sends documents set on the document tray automatically to the copyboard for copy operation. Reverses two-sided documents automatically.
Editor
With a cordless pen, accepts input for areas and color specification.
(NP-3825 only)
Sorter VIII
Sorts and groups up to 20 copies automatically.
Staple Sorter
In addition to serving as a sorter, staples the sorted copies automatically.
MS-5
Sorts and groups up to 10 copies automatically.
Cassette Feeding Unit
Allows addition of two cassettes to the copier.
Paper Deck
Accepts up to 1000 sheets of paper.

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GENERAL DESCRIPTION

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I. FEATURES

1. Front loading.

The paper deck and cassettes are loaded from the front of the NP-3825/3325. This arrangement saves office space, and the compact design makes the NP-3825/3325's introduction to the office easier than before.

2. One-touch automatic 2-color copies. (NP-3825 only)

As part of the duplexing system, the NP-3825 is equipped with a developing assembly for color toner in addition to that for the standard black toner, and a simple key operation automatically turns out 2-color copies.

3. Extra-fine one-component toner for enhanced image quality.

Drawing on the projection method, the extra-fine toner promises the highest image quality ever.

4. A full line of basic features.

- Zooms between 50% to 200%. In addition, 8-step reduction and enlargement modes.
- Takes copy paper as large as A3 or as small as postcard. Deals also with tracing paper and OHP.
- Allows choice of additional color from red, blue, green, and brown. (NP-3825 only)
- Has a set-back system for two-sided copies. (NP-3825 only)

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II. SPECIFICATIONS

A. Construction

	NP-3825	NP-3325
Body	Desk-top type	
Copyboard	Fixed	
Light source	Halogen lamp 300 W (115 V machine)	
Lens	Zoom	
Photosensitive medium	OPC	

B. Type

		NP-3825	NP-3325
Copying		Indirect electrostatic	
Charging		Corona	
Exposure		Slit (moving light source)	
Copy density control		Automatic (AE) or manual	
Development		Dry (black developing assembly + CD unit)	Dry (black developing assembly only)
Paper pick-up	Automatic	2 cassettes (4 cassettes if with cassette feeding unit), paper deck	
	Manual	Manual feed tray	
Transfer		Corona	
Separation		Corona (electrostatic)	
Cleaning		Blade	
Fixing		Heater roller (850 W)	

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C. Performance

			NP-3825	NP-3325
Document type			Sheet, Book, 3-D objects (2 kg max.)	
Document size (max.)			A3 (297 × 420 mm)/Ledger (11" × 17")	
Reproduction ratio			DIRECT, Fixed (Table 1-1), Zoom (50% to 200%)	
Warm-up			3 min or less (at 20°C)	
First copy			8 sec or less (A4 in AE)	
Continuous copying			99 copies max.	
Copy speed			See Table 1-2.	
Copy size			A3/Ledger (297 × 431.8 mm) max. Postcard (100 × 148 mm) min.	
Copy paper	From cassette		Plain paper (64 to 80 g/m²), Tracing paper (SM1), Colored paper	
	From manual feed tray		Plain paper (64 to 128 g/m²), Tracing paper (SM1, GNT80), Colored paper; OHP film, Label; Commercial or Canon-recommended postcard	
	Two-sided/ Overlay*	Automatic	Plain paper (64 to 80 g/m²), Colored paper (10 sheets max.; A4, B5, LTR)	
		From manual feed tray	Plain paper (64 to 128 g/m²), Colored paper; OHP film (overlay only); Commercial or Canon-recommended postcard	
Cassette			Front-loading with claws (about 250 sheets of 80 g/m² paper)	
Copy tray			100 sheets (approx., 80 g/m²)	
Non-image area (width)			2.5 ±1.5 mm (leading edge); 2.0 ±1.0 mm (left/right)	
Auto-clear			Provided. (2 min standard, variable between 1 to 9 min in 1-min increment; may be disabled)	
Auto shut-off			Provided. (2 hr standard; may be disabled)	
Options			D-ADF, D-ADF Editor, Editor, MS-5, Staple Sorter, Sorter VIII, Cassette Feeding Unit, Paper Deck, Control Card V	

*NP-3825 only.

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D. Others

		NP-3825		NP-3325
Operating environment	Temperature	45.5°F to 90.5°F/7.5°C to 32.5°C		
	Humidity	10% to 85%		
	Atmospheric pressure	0.6 to 1 atm		
Power source			with Editor	
	100V 50/60 Hz	ASM XXXXX	ASN XXXXX	ATJ XXXXX
	115V 60 Hz	CSM XXXXX		CTJ XXXXX
	220V 50 Hz	DSM XXXXX		DTJ XXXXX
	240V 50 Hz	ESM XXXXX		ETJ XXXXX
	240V 50 Hz	FSM XXXXX		FTJ XXXXX
	220V 50 Hz	GSM XXXXX		GTJ XXXXX
	220V 50 Hz	HSM XXXXX		HTJ XXXXX
	220V 50 Hz	KSM XXXXX		KTJ XXXXXX
Power consumption	Max.	1.5kW or less		
	When copying	0.894 kW (per hr)		
	At standby	0.163 kW (per hr)		
Noise	When copying	55 dB or less (1 m from machine)		
	At standby	40 dB or less (1 m from machine)		
Ozone		0.1 ppm or less (average over 8 hr)		
Dimensions	Width	30.5 in./775 mm		
	Depth	26.2 in./665 mm		
	Height	23.5 in./596 mm		
Weight		193 lb./87.6 kg		176 lb./80 kg.
Consumables	Copy paper	Keep wrapped to protect against humidity.		
	Toner	Avoid direct sun, and store under 104°F/40°C and 85%.		
	CD unit	Keep in box or cassette feeding unit. Avoid sun, and store under 86°F/30°C and 85%.		

	DIRECT	REDUCE*		ENLARGE*	
100/220/240V	1 : 1 (±0.5%)	1 : 0.500 1 : 0.707 1 : 0.816 1 : 0.867	±1.0%	1 : 1.154 1 : 1.226 1 : 1.414 1 : 2.000	±1.0%
115V	1 : 1 (±0.5%)	1 : 0.500 1 : 0.647 1 : 0.773 1 : 0.786	±1.0%	1 : 1.214 1 : 1.294 1 : 2.000	±1.0%
220/240V	1 : 1 (±0.5%)	1 : 0.500 1 : 0.707	±1.0%	1 : 1.414 1 : 2.000	±1.0%

*±1.0%.

Table 1-1 Fixed Reproduction Ratios

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Reproduction ratio		Copy size	No. of copies/min
DIRECT	1 : 1 (±0.5%)	A3	15
		A4	25
		B4	17
		B5	25
		Ledger	20
		Legal	23
		Letter	35
REDUCE	1 : 0.647	Ledger → Letter R	26
	1 : 0.707	A3 → A4R	25
		B4 → B5R	28
	1 : 0.773	Ledger → Legal	23
	1 : 0.786	Legal → Letter R	27
	1 : 0816	B4 → A4R	26
	1 : 0.865	A3 → B4	22
		A4 → B5	35
ENLARGE	1 : 1.414	A4R → A3	20
		B5R → B4	23
	1 : 1.294	Letter → Ledger	20
	1 : 1.224	A4R → B4	23
	1 : 1.214	Legal → Ledger	20
	1 : 1.154	B4 → A3	20
		B5 → A4	35

Table 1-2 Copy Speed

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Paper size	Dimensions	
	(mm)	(in.)
A3	297 × 420	11.7 × 16.5
A4	210 × 297	8.3 × 11.7
A5	148.5 × 210	5.8 × 8.3
B4	357 × 364	10.1× 14.3
B5	182 × 257	7.2 × 10.1
B6	128.5 × 182	5.1 × 7.2
Ledger (11" × 17")	279.4 × 431.8	11 × 17
Legal	216 × 356	8.5 × 14
Letter	216 × 279	8.5 × 11
Mini (STMT)	139.5 × 216	5.5 × 8.5
Korean Legal	190 × 265	7.5 × 10.4
Folio	210 × 330	8.3 × 13
Foolscap	216 × 330	8.5 × 13
Australian Foolscap	206 × 337	8.1 × 13.3
Argentine Legal	220 × 340	8.7 × 13.4
Argentine Letter	220 × 280	8.7 × 11.0
U.S. Goverment Legal	203 × 330	8 × 13
U.S. Goverment Letter	203 × 267	8 × 10.5
Officio	216 × 317	8.5 × 12.5
Argentine Officio	220 × 340	8.7 × 13.4
Ecuadorean Officio	220 × 320	8.7 × 12.6
Bolivian Officio	216 × 355	8.5 × 14.0

Table 1-3 Paper Sizes

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E. Editor

Effective area	297 × 432 mm
Area designation accuracy	±1.0 mm (editor alone; does not include input errors of pen or other instruments)
Input	By pen (buzzer sounded upon input)
Area designation	3 areas max. (input by diagonal points)
Color conversion	Framing, Blanking, 2-color
Power source	5V (from host)
Dimensions	555 W × 490 D × 43 H (mm)
Weight	3 kg

F. Cassette Feeding Unit

Copy paper	As per host.
Power source	24V DC (from host)
Dimensions	705 W × 570 D × 334 H (mm)
Weight	34.5 kg

G. Paper Deck

Paper size	A4, B5, Letter
Paper type	Plain paper (64 g/m² to 80 g/m²)
Capacity	115 mm deep (about 1000 sheets of 80 g/m² paper)
Power source	24V DC (from host)
Dimensions	705 W × 570 D × 334 H (mm)
Weight	31 kg

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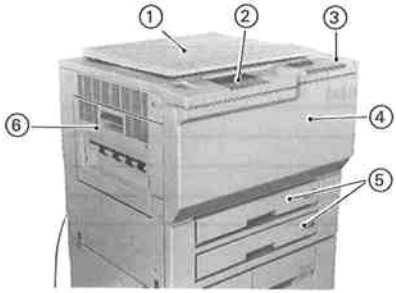
III. NAMES OF PARTS

A. Exterior View



① Copyboard cover
② Control panel
③ Power switch
④ Front door
⑤ Cassettes
⑥ Delivery unit cover

Figure 1-1

① Fixing assembly knob
② Lower feeder unit release lever (NP-3825 only)
③ Lower feeder unit (NP-3825 only)
④ Hopper

Figure 1-2

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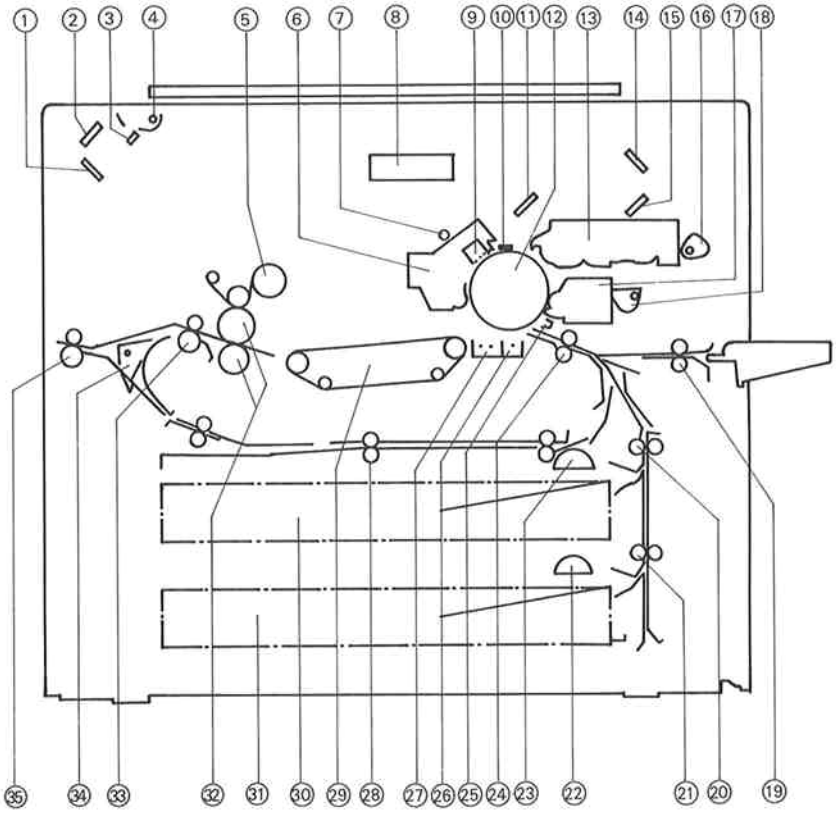
B. Cross-Sectional View

1. Cross Sections

■ NP-3825



① Mirror 3
② Mirror 2
③ Mirror 1
④ Scanning lamp
⑤ Cleaning belt
⑥ Cleaning unit
⑦ Pre-conditioning exposure lamp
⑧ Zoom lens
⑨ Primary corona unit
⑩ Blank exposure lamp
⑪ Mirror 6
⑫ Photosensitive drum
⑬ CD unit
⑭ Mirror 4
⑮ Mirror 5
⑯ Cam C
⑰ Developing assembly (black)
⑱ Cam B
⑲ Manual feed pick-up roller
⑳ Roller 1 (vertical path)
㉑ Roller 2 (vertical path)
㉒ Pick-up roller (cassette 2)
㉓ Pick-up roller (cassette 1)
㉔ Registration roller
㉕ Pre-transfer corona unit
㉖ Transfer corona unit
㉗ Separation corona unit
㉘ Set-back roller
㉙ Feeder unit
㉚ Cassette 1
㉛ Cassette 2
㉜ Fixing roller
㉝ Delivery roller 1
㉞ Deflector
㉟ Delivery roller 2

Figure 1-3A

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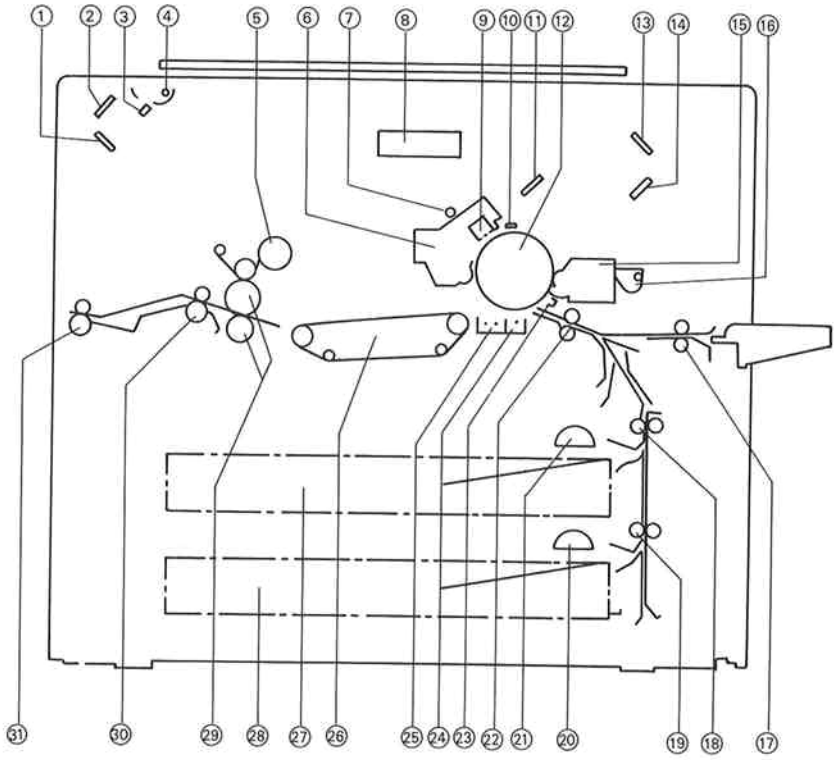
■ NP-3325



① Mirror 3
② Mirror 2
③ Mirror 1
④ Scanning lamp
⑤ Cleaning belt
⑥ Cleaning unit
⑦ Pre-conditioning exposure lamp
⑧ Zoom lens
⑨ Primary corona unit
⑩ Blank exposure lamp
⑪ Mirror 6
⑫ Photosensitive drum
⑬ Mirror 4
⑭ Mirror 5
⑮ Developing assembly (black)
⑯ Cam B
⑰ Manual feed pick-up roller
⑱ Roller 1 (vertical path)
⑲ Roller 2 (vertical path)
⑳ Pick-up roller (cassette 2)
㉑ Pick-up roller (cassette 1)
㉒ Registration roller
㉓ Pre-transfer corona unit
㉔ Transfer corona unit
㉕ Separation corona unit
㉖ Feeder unit
㉗ Cassette 1
㉘ Cassette 2
㉙ Fixing roller
㉚ Delivery roller 1
㉛ Delivery roller 2

Figure 1-3B

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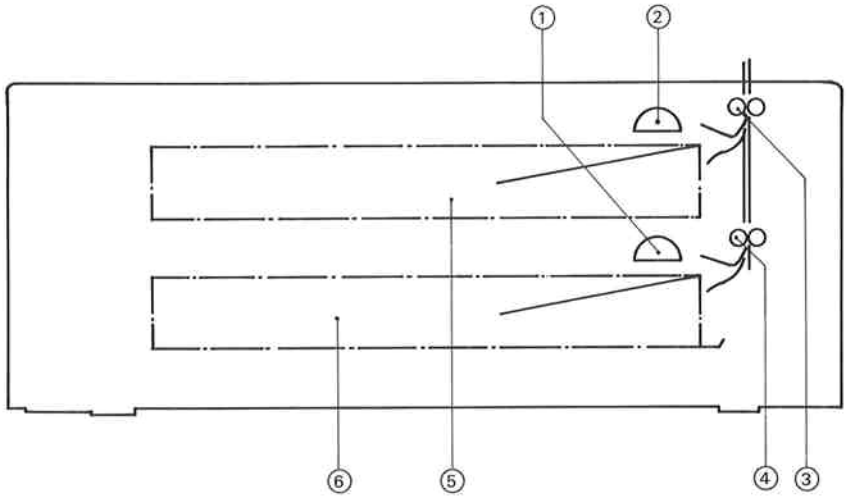
2. Cross Section of Cassette Feeding Unit



① Pick-up roller (cassette 4)
② Pick-up roller (cassette 3)
③ Roller 3 (vertical path)
④ Roller 4 (vertical path)
⑤ Cassette 3
⑥ Cassette 4

Figure 1-4 Cross Section of Cassette Feeding Unit

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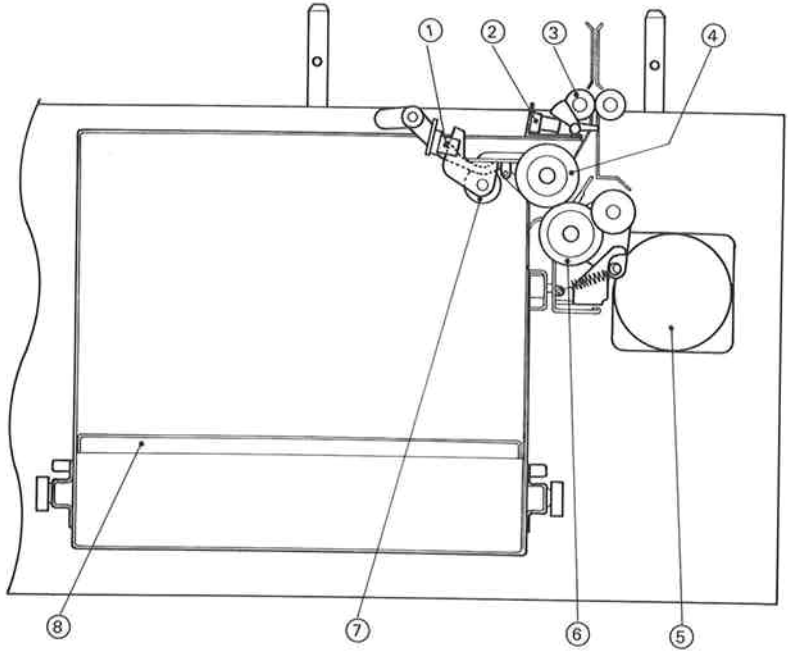
3. Cross Section of Paper Deck



① Lifter position sensor
② Deck pre-registration paper sensor
③ Deck registration roller
④ Feeder roller
⑤ Deck motor
⑥ Separation roller
⑦ Pick-up roller
⑧ Lifter

Figure 1-5 Cross Section of Paper Deck

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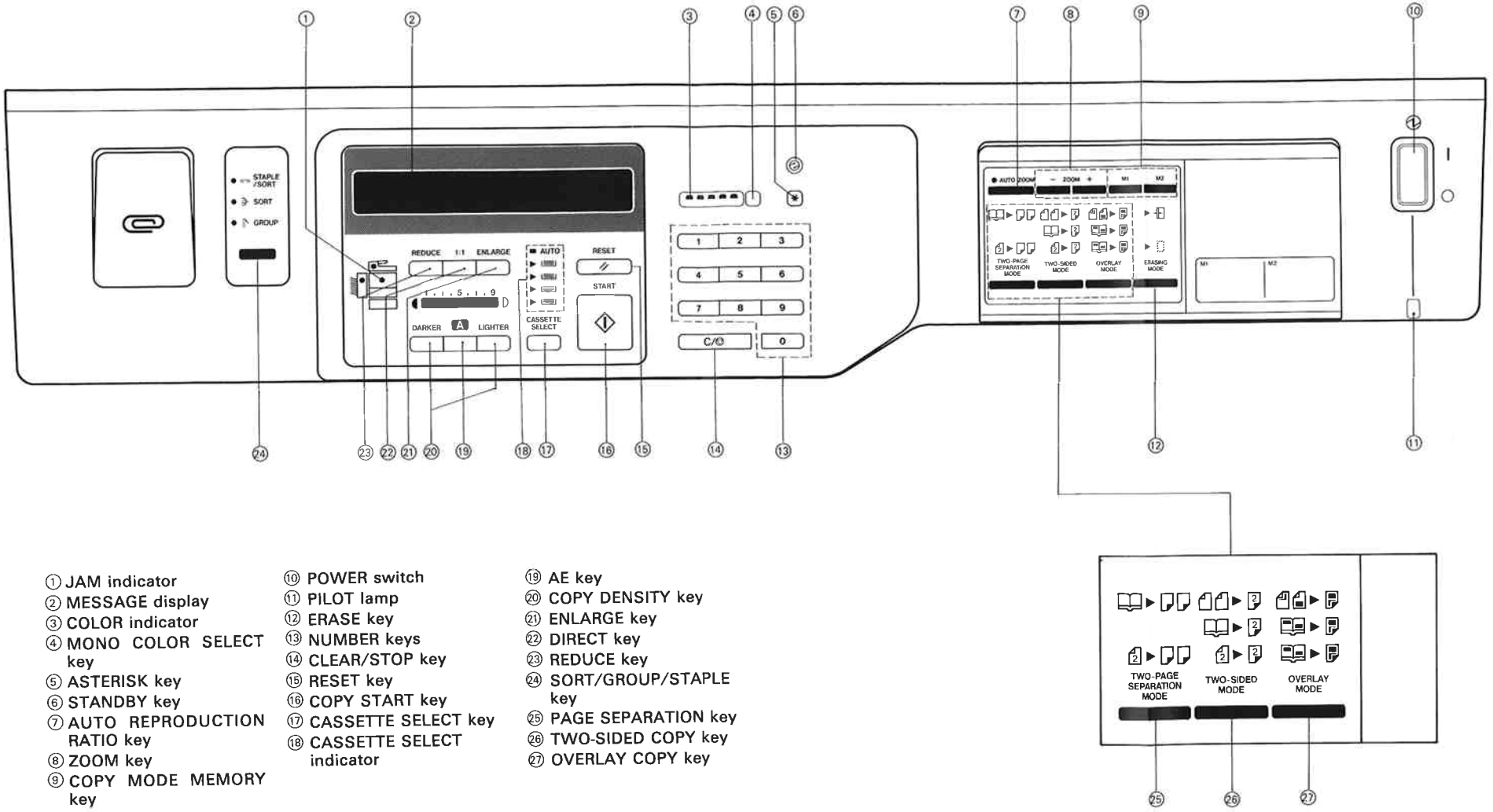
IV. OPERATION

A. Control Panel

■ NP-3825



① JAM indicator
② MESSAGE display
③ COLOR indicator
④ MONO COLOR SELECT key
⑤ ASTERISK key
⑥ STANDBY key
⑦ AUTO REPRODUCTION RATIO key
⑧ ZOOM key
⑨ COPY MODE MEMORY key
⑩ POWER switch
⑪ PILOT lamp
⑫ ERASE key
⑬ NUMBER keys
⑭ CLEAR/STOP key
⑮ RESET key
⑯ COPY START key
⑰ CASSETTE SELECT key
⑱ CASSETTE SELECT indicator
⑲ AE key
⑳ COPY DENSITY key
㉑ ENLARGE key
㉒ DIRECT key
㉓ REDUCE key
㉔ SORT/GROUP/STAPLE key
㉕ PAGE SEPARATION key
㉖ TWO-SIDED COPY key
㉗ OVERLAY COPY key

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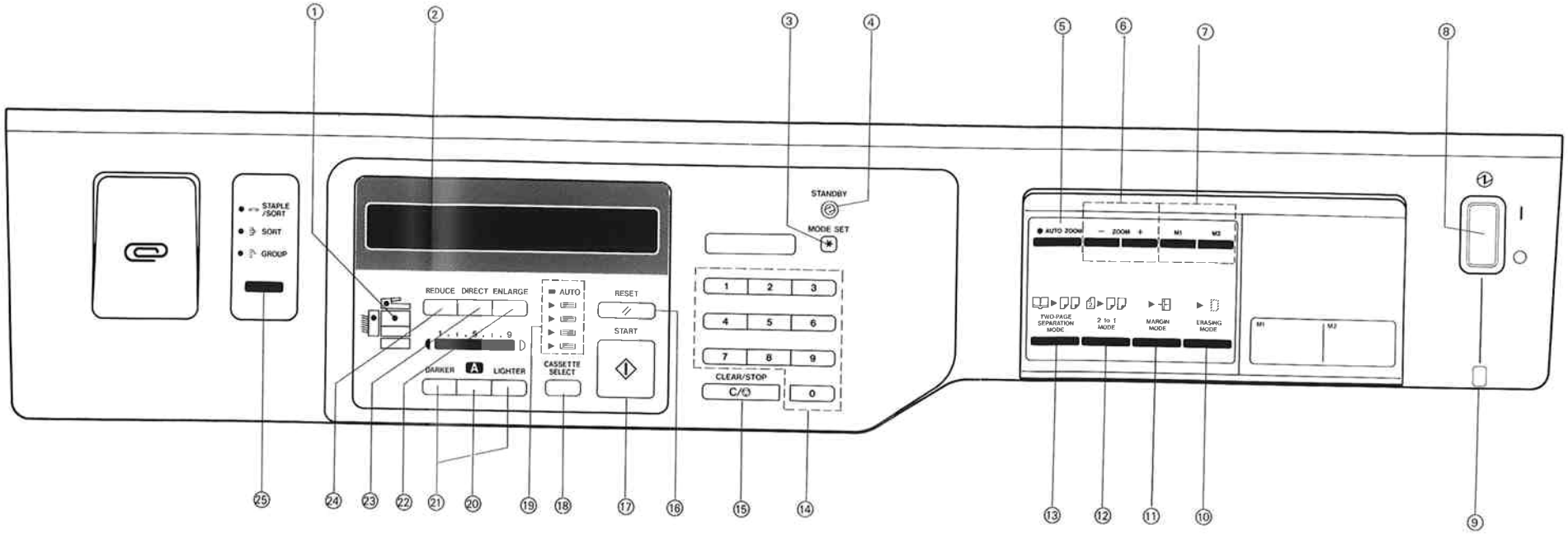

① JAM indicator
② MESSAGE display
③ ASTERISK key
④ STANDBY key
⑤ AUTO REPRODUCTION RATIO key
⑥ ZOOM key
⑦ COPY MODE MEMORY key
⑧ POWER switch
⑨ PILOT lamp
⑩ ERASE key
⑪ BIND key
⑫ TWO-SIDED COPY key
⑬ PAGE SEPARATION key
⑭ NUMBER keys
⑮ CLEAR/STOP key
⑯ RESET key
⑰ COPY START key
⑱ CASSETTE SELECT key
⑲ CASSETTE SELECT indicator
⑳ AE key
㉑ COPY DENSITY key
㉒ ENLARGE key
㉓ DIRECT key
㉔ REDUCE key
㉕ SORT/GROUP/STAPLE key

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Guide to Control Panel

Name	Functions	Remarks
1. MESSAGE display	With the standard screen, the display identifies the reproduction ratio, paper size selected, and number of copies. With the service mode screen, the display shows messages for mode settings.	
2. COLOR SELECT keys (NP-3825 only)	Press the key to select either black, red, blue, green, or brown for the copy.	
3. STANDBY key	Press the key to select or cancel the power-saving feature.	Keeps at 180°C.
4. ASTERISK key	Press the key to select the user modes, enter settings, or operate the machine in the user modes.	
5. POWER switch	Press the key to turn the machine ON and OFF.	
6. NUMBER keys	Use the keys to set the number of copies to make or to enter values when setting modes.	
7. CLEAR/STOP key	Press the key to clear the number of copies to 1 or to stop the copy run.	
8. RESET key	Press the key to select the standard modes for copy operation. Standard modes: Reproduction ratio .... 100% Paper size .... AUTO SELECT Number of copies ..... 1 Color of copy ..... Black	
9. COPY START key	Press the key to start copy operation.	
10. CASSETTE SELECT key	Press the key for auto paper selection or for selection of a cassette.	If cassettes of the same size are set, the lower cassette will be selected.
11. ENLARGE key	Press the key to select the ENLARGE mode. (with fixed reproduction ratio)	
12. AE key	Press the key to select or cancel the automatic exposure mode (AE).	
13. COPY DENSITY keys	Press the keys to adjust the copy density manually.	
14. DIRECT key	Press the key to return the reproduction ratio to DIRECT (100%).	
15. REDUCE key	Press the key to select the REDUCE mode. (with fixed reproduction ratio)	
16. STAPLE/SORT/ GROUP key	Press the key to select the staple, sort, and group modes. (staple mode effective only with staple sorter; sort and group modes effective only with sorter or staple sorter)	
17. AUTO ZOOM key	Press the key to select or cancel the automatic zoom mode.	
18. ZOOM keys	Press the keys to set reproduction ratios between 50% and 200% in 1% increment.	

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Name	Functions	Remarks
19. MODE MEMORY keys	Press the keys to recall copy modes stored in memory. (To store modes, press the ⊠ key, memory key desired, and ⊠ key.)	
20. COPY MODE memo label	Use it to keep notes of the copy modes stored in memory.	
21. ERASE key	Press the key to select or cancel the erasing mode or to switch between the following: Frame erasing: erases a width of 7 mm on four sides of copies. Binding: may be set for 10 mm, 15 mm, or 20 mm. (10 mm at time of shipment)	Normally, left binding.
22. OVERLAY mode key (NP-3825 only)	Press the key to select the following modes: 1. Overlay copy 2. Two-page separation/overlay copy 3. Two-page separation/color overlay copy	10 copies max. for A4, B5, and LTR; 1 copy for other sizes.
23. TWO-SIDED mode key (NP-3825 only)	Press the key to select the following modes: 1. One-sided document to two-sided copy 2. Two-page separation/two-sided copy 3. Two-sided document to two-sided copy*	10 copies max. for A4, B5, and LTR; 1 copy for other sizes. * Effective with D-ADF only.
24. TWO-PAGE SEPARATION mode key (NP-3825 only)	Press the key to select the following modes: 1. Two-page separation copy 2. Two-sided page separation copies*	* Effective with D-ADF only.

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B. Asterisk Mode (user options)

The copying machine is equipped with the asterisk mode, in which the user can change the settings of the machine to suit his/her needs.

No.	Item
1	Zoom program
2	Mixed document sizes
3	Binding (width)
4	Density
5	Auto clear
6	Document auto count
7	Area designation
8	Copy mode memory

Table 1-3 Asterisk Mode

1. Zoom Program

Enter the size of the document and that of the copy; the copying machine calculates the most suitable reproduction ratio.

1) Press the ✳, 1, and ✳ keys in sequence.

Figure 1-7

2) Enter the size of the document using the NUMBER keys, and press the ✳ key.
- For example, enter 100 mm.

Figure 1-8

3) Enter the size of the copy.
- For example, enter 60 mm.

Figure 1-9

4) Press the ✳ key.
- The copying machine calculates the size and sets the reproduction ratio; 60 ÷ 100 = 0.6, i.e., 60%.

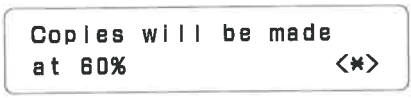

Figure 1-10

Note:
If the result of the calculation is 50% or less, the reproduction ratio will be 50%; if 200% or more, 200%.

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2. Mixed Document Sizes

Documents of different sizes may be palced on the feeder; the copying machine automatically selects the paper and reproduction ratio for each document.

Note:
The documetns need to be equal in width with respect to feed direction; i.e., A4 and A3 or B5 and B4.

1) Press the ⊠, [2], and ⊠ keys in sequence.

```
Mixed size originals
   0:OFF 1:ON <0, 1><*>
```

Figure 1-11

2) Enter [0] or [1] using the NUMBER keys.
3) Press the ⊠ key to return to the standard screen.

3. Binding

For copies with a binding margin, the margin may be of one of three widths.

1) Press the ⊠, [3], and ⊠ keys in sequence.

```
Margin 1:10mm 2:15mm
       3:20mm   <1,.3>
```

Figure 1-12

2) Enter [1], [2], or [3] using the NUMBER keys.

- For example, enter '2'.

```
Margin= 15mm stored.
```

Figure 1-13

3) Press the ⊠ key to return to the standard screen.

4. Density

If the copies seem too dark or too light even after density adjustment, use the mode for further correction.

1) Press the ⊠, [4], and ⊠ keys in sequence.

```
          ▼          <D. L KEY>
◀1. . . 5. . . 9▶      <*>
```

Figure 1-14

2) For a darker copy, press the D key; for a lighter copy, press the L key.
3) Press the ⊠ key to return to the standard screen.

5. Auto Clear

The auto clear time may be one to nine minutes in one-minute increment; if set to 0, the feature will be disabled.

1) Press the ⊠, [5], and ⊠ keys in sequence.

```
Auto Clear Time
Now= 2 min. <NUMBER><*>
```

Figure 1-15

- To set it to five minutes.

2) Enter '5'.

```
Copier will auto-clear
in 5 minutes.
```

Figure 1-16

3) Press the ⊠ key to return to the standard screen.

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6. Cancellation of Document Auto Count (feeder)

When making two-sided copies from a one-sided document of multiple pages in the feeder, the number of pages is counted before the copy run is started so that the first page of the document is on the front side of the first copy; if the document consists of an odd number of pages, the last copy will be a one-sided copy. The feature, however, may be canceled as follows:

1) Press ⊠ , 6, and ⊠ keys.

Figure 1-17

2) Enter '0' or '1'.
- If '0' is entered,

Figure 1-18

- If '1' is entered.

Figure 1-19

3) Press the ⊠ key to return to the standard screen.

7. Area Designation (NP-3825 only)

An area may be designated over the document.

1) Press the ⊠ , 7, and ⊠ keys.

Figure 1-20

Note:
The message '3: 2-color' is not available for NP-3825s without a CD unit.

2) Enter '1' through '3'.
- If '1' (framing) or '2' (blanking) is selected,

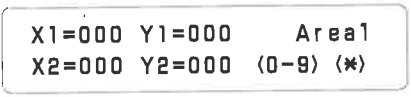

Figure 1-21

- If '3' (2-color) is selected,

Figure 1-22

- Press the 1 key to copy the area in mono-color; press the 2 key to copy outside the area in mono-color. After selection, the indication is as after selection of '1' or '2'.

3) Enter a value over the flashing cursor, and press the ⊠ key; the cursor moves to the next point of insertion.

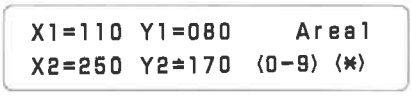

Figure 1-23

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When coordinates X1 through Y2 are entered, the following message will be indicated.

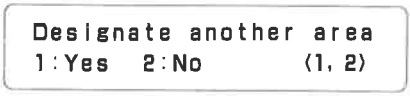

Figure 1-24

4) Press the [1] key to select areas 2 and 3; operate the same way as to select area 1. To skip ahead without selecting areas 2 and 3, press the [2] key to return to the standard screen.

8. Copy Mode Memory

Up to two copy modes may be stored for a recall.

1) Set the copy modes desired using the keys on the operation panel.
2) Press the ✳ key.

Figure 1-25

3) Press the MODE MEMORY key ([M1] or [M2]).
4) Press the ✳ key to store the modes.

- To recall.
  Press the MODE MEMORY key under which the modes are stored.

Note:
The memory is retained even after the POWER switch is turned OFF.

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V. WARNINGS AND REQUIRED ACTION

A. 'JAM'

Open front cover and
remove jammed paper.

Figure 1-26

The message appears when there is a paper jam in the copying machine. Perform the following to remove the jam.

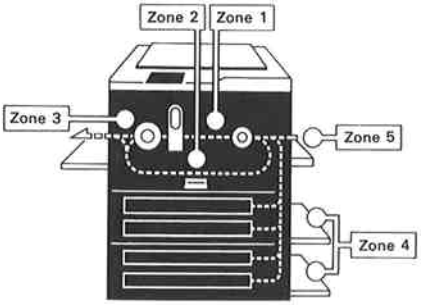

Figure 1-27

1. If lamp 1 (Zone 1) lights, perform the following:
   1) Turn the lever clockwise, and remove the jam.

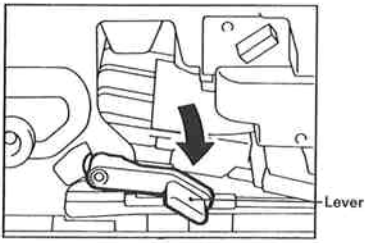

Figure 1-28

2. If lamp 2 (Zone 2) lights, perform the following:
   1) Push the lever up, and remove the jam.

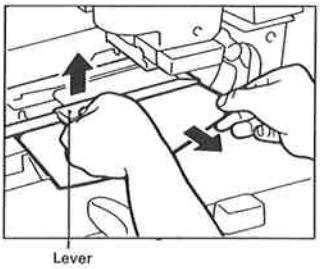

Figure 1-29

3. If lamp 3 (Zone 3) lights, perform the following:
   1) Remove the copy tray, and open the delivery door. If the paper is trapped in the fixing assembly, turn the knob counterclockwise, and remove the jam.

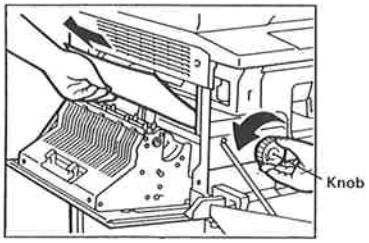

Figure 1-30

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4. If lamp 4 (Zone 4) lights, perform the following:
   1) Open the upper right door of the cassette holder, and remove the jam. Pull out the cassette, if necessary.

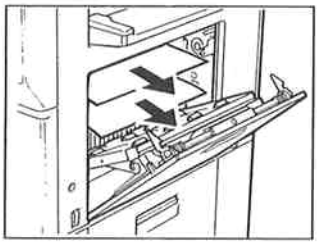

Figure 1-31

5. If lamp 5 (Zone 5) lights, perform the following.
   1) Lift the manual feed tray cover, and remove the jam.

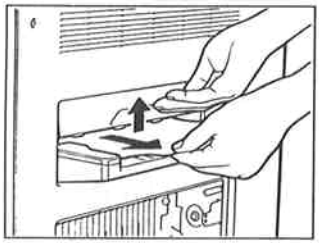

Figure 1-32

6. If lamp 6 (Zone 6) lights, perform the following:
   1) Open the lower right door of the cassette holder, and remove the jam. Pull out the cassette, if necessary.

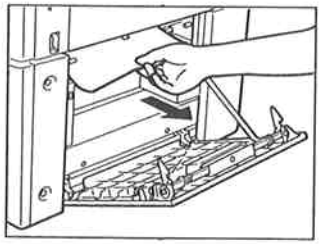

Figure 1-33

B. 'ADD PAPER'

Figure 1-34

The message appears when the cassettes have run out of paper. Set paper as follows:
1) Hold the grip of the cassette selected, and pull the cassette until it stops.
2) Unwrap fresh copy paper, and hold the stack of paper face down.

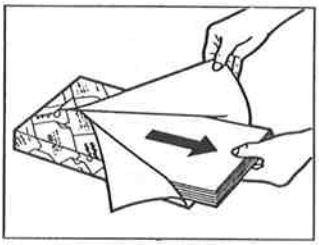

Figure 1-35

3) Place the paper on the plate of the cassette, and arrange the edges of the sheets in order.

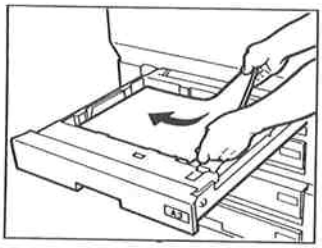

Figure 1-36

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4) Set the cassette in the cassette holder.

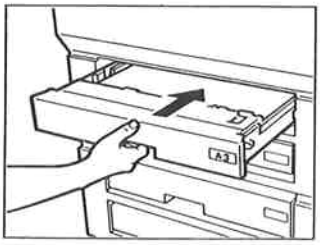

Figure 1-37

C. Adding Toner

1. 'ADD BLACK TONER'

Figure 1-38

The message appears when the black toner has run out. Perform the following:

1) Open the front door.
2) Swing out the hopper unit.
3) Open the upper cover of the hopper unit.

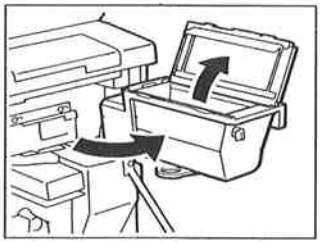

Figure 1-39

4) Check the new toner cartridge for toner color, and shake it side to side about ten times.

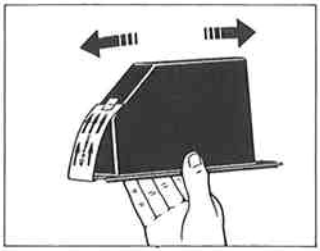

Figure 1-40

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5) Keep the end of the toner cartridge against the groove at the rear of the hopper unit and, while holding the cartridge with one hand, pull out the seal with care.

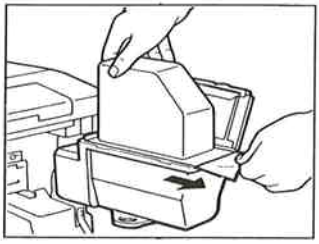

Figure 1-41

6) Tap lightly on the top of the toner cartridge until all toner in the cartridge is in the hopper unit.
7) Detach the toner cartridge with care.
8) Close the upper cover of the hopper unit.
9) Swing the hopper unit back into the copying machine.
10) Close the front door.

Note:
See CHAPTER 5 for how to supply black toner at time of installation.

2. 'ADD COLOR TONER' (NP-3825 only)

Figure 1-42

The message appears when the color toner has run out. Check the color, and perform the following:

1) Open the front door of the copying machine.
2) Hold the grip, and pull out the CD unit.

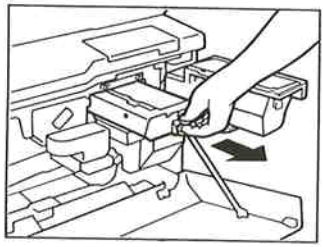

Figure 1-43

3) Open the toner supply cover of the CD unit.
4) Check the new toner cartridge for color, and shake it side to side about ten times.
5) Keep the toner cartridge in contact with the CD unit and, while holding the cartridge with one hand, pull out the seal with care.

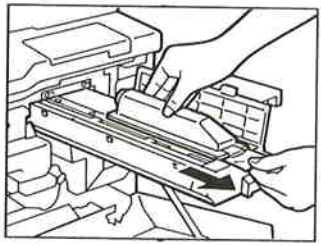

Figure 1-44

6) Tap lightly on the top of the toner cartridge until all toner inside the cartridge is in the hopper unit.
7) Hold the toner cartridge, and detach it with care.
8) Close the toner supply cover, and lock it.
9) Push the CD unit back into the copying machine.

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VI. ROUTINE INSPECTION BY THE USER

Instruct the user to clean the following at least once a week.

a. Copyboard glass.
   Wipe it with a moist cloth and then with a dry cloth.
b. Copyboard cover.
   Wipe it with mild detergent solution and with a dry cloth.
c. Primary and transfer/separation corona units.
   Slide the units out and in several times to clean the corona wires.

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CHAPTER 2

COPYING PROCESS

I. IMAGE FORMATION PROCESS 2-1

II. AUXILIARY PROCESSES 2-6

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I. IMAGE FORMATION PROCESS

A. Outline

■ NP-3825

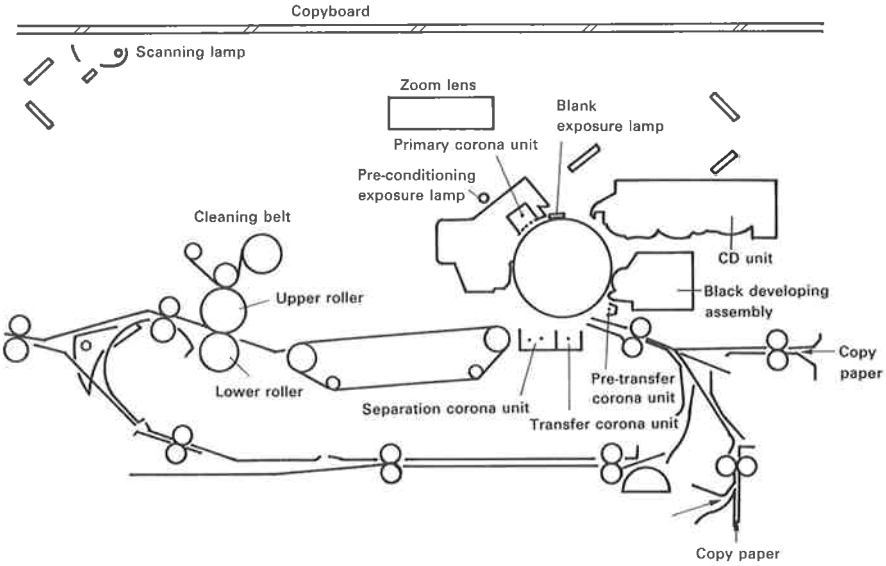

Figure 2-1

The copying machine is of an electrophotographic type equipped with a photosensitive drum. See Figure 2-1 for its construc-tion.

Figure 2-2 is a sequential diagram showing how steps involved in forming images are related to each other.

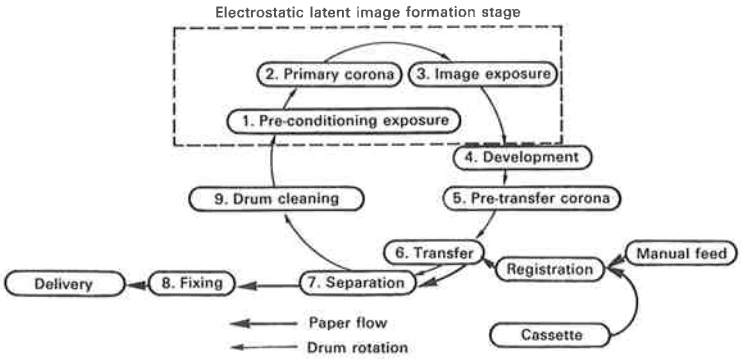

Figure 2-2

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Images are formed in the following nine steps.

Step 1 Pre-conditioning exposure
Step 2 Primary corona (negative DC)
Step 3 Image exposure
Step 4 Development (AC and negative DC bias)
Step 5 Pre-transfer corona (AC and positive DC)
Step 6 Transfer corona (negative DC)
Step 7 Separation corona (AC and negative DC)
Step 8 Fixing
Step 9 Drum cleaning

The photosensitive drum is of a seamless type and of a two-layer construction; its outer layer is made of organic photoconductor (OPC), and the inner layer is an aluminum base made of conducting material.

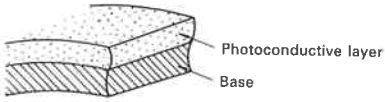

Figure 2-3

B. Formation of Electrostatic Latent Image

Step 1 Pre-conditioning exposure

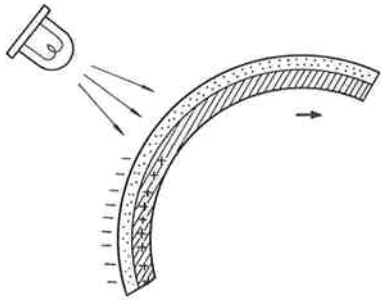

Figure 2-4

In this step, or pre-conditioning exposure, the surface of the drum is exposed to light from the pre-conditioning exposure lamp. All charges remaining on the surface of the drum from the preceding copy cycle are eliminated in preparation for exposure by the primary corona. Such charges, if left as they are, could result in copies with uneven density.

Step 2 Primary corona

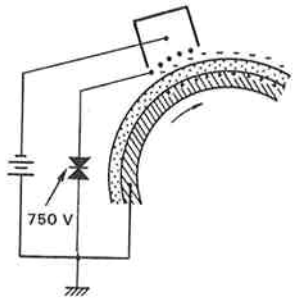

Figure 2-5

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In this step, the drum is exposed by the primary corona. As a result, its surface will come to have a uniform layer of negative charges and maintain primary potential.

The surface potential of the drum is determined by the value of the grid bias.

Step 3 Image exposure

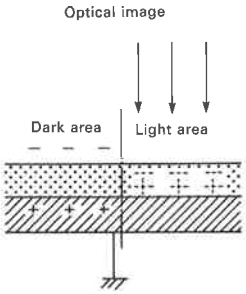

Figure 2-6

In this step, the optical image of the document is projected on the surface of the drum to neutralize the charges in light areas.

At the end of these three steps above, the areas of the drum corresponding to dark areas of the document are left with negative charges, and those representing light areas are rid of negative charges.

The pattern of charges so formed is not visible to the human eye and, therefore, is called an "electrostatic latent image."

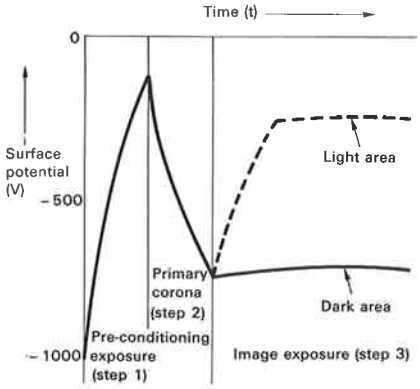

Figure 2-7

Step 4 Development

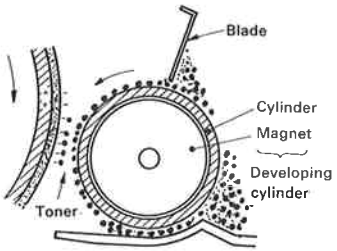

Figure 2-8

As shown in Figure 2-8, the developing assembly consists of a developing cylinder and a magnetic blade; the developing cylinder itself is made up of a magnet fixed in position and a cylinder which rotates around the magnet.

The black developer is a single-component developer of magnetite and resin. The developer has insulating properties and is charged to a positive potential by friction against the rotating cylinder.

The color developer is a fixed-ratio mixture of carrier (iron powder) and toner (resin).

By friction against the rotating cylinder, the iron powder is charged to a negative potential, and the toner to a positive potential.

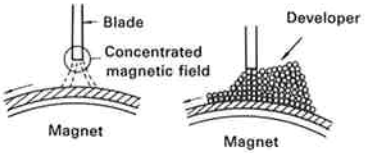

Figure 2-9

A concentrated magnetic field develops between the magnet and the tip of the blade, and the developer is attracted to the magnetic field.

The magnetic field holds the developer it has attracted virtually immobile and creates a collection of developer particles hanging from the tip of the blade. As the cylinder rotates, the developer particles leave the magnetic field to deposit themselves on the cylinder in a thin, uniform layer.

Since both the developing cylinder and the blade are given an AC bias and DC bias (negative component) at the same time, the resulting wave form of the developing bias

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has a larger negative component than positive.

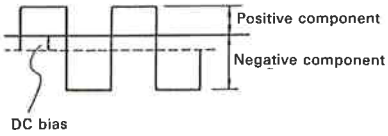

Figure 2-10

During copy operation, the toner is attracted to the drum by the work of the surface potential of the drum and the developing bias (at time of positive component), and it turns the electrostatic latent image to a visible image. The excess toner is repelled by the surface potential of the drum and the developing bias (at time of negative component).

An AC bias, its frequency in particular, primarily affects tone gradation; lower frequency will give better gradation, but more fogging. A DC bias, on the other hand, affects copy density and is also related to fogging; a larger bias, i.e., approaching 0 V, increases the density but, at the same time, causes more fogging.

Step 5 Pre-transfer corona

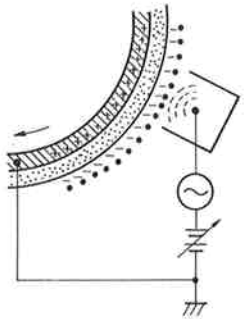

Figure 2-11

In this step, an AC corona discharge in combination with a DC bias optimizes the potential of the toner on the drum surface and, at the same time, eliminates excess charge from the drum surface. This serves to improve transfer efficiency and facilitate separation of the copy paper from the drum.

Step 6 Transfer

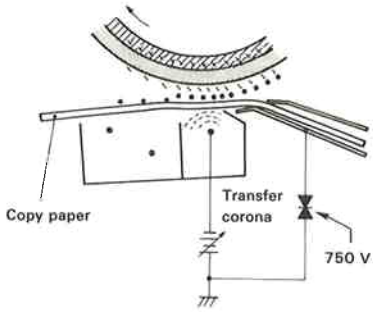

Figure 2-12

In this step, a negative corona is applied to the back of the copy paper so as to attract the positively charged toner to the paper.

To prevent poor transfer or soiling the back of the paper, the transfer guides are grounded through a varistor.

Note:
If grounded directly, the transfer guides will allow the charge needed on the back of the copy paper to escape; if not grounded, on the other hand, the transfer guides will be charged, coated with toner, and become soiled.

Once having left the fixing assembly, the copy paper is dry because of heat and has a high electrical resistance. For this reason, the transfer corona discharge is reduced during the second copy cycle in the automatic two-sided copy mode or image overlay copy mode to prevent poor separation of the copy paper after transfer.

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Step 7 Separation

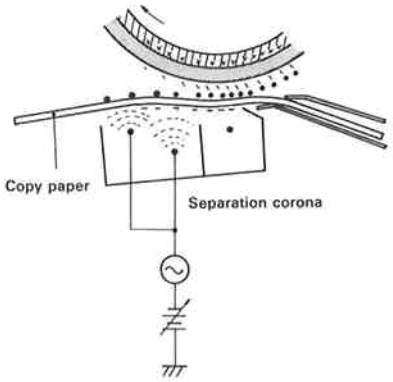

Figure 2-13

Step 7 is where copy is separated from the drum. The copy paper has been given a negative potential by the transfer corona and attracted to the surface of the drum by the work of electrostatic force. To separate the paper from the drum, an AC corona with a DC bias is applied to break the electrostatic force between the drum and the paper.

The copy paper comes out of the fixing assembly with a curl. For this reason, the output of the separation corona discharge is increased during the second copy cycle in the automatic two-sided copy mode or image overlay mode to ensure proper separation.

Step 8 Fixing

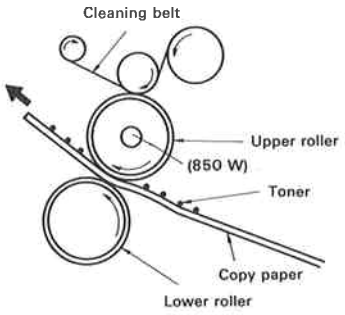

Figure 2-14

In this step, the copy paper carrying a transfer image moves between two heater rollers, and the transfer image is fixed to the paper.

To prevent jams and toner offset, the upper roller remains in contact with a cleaning belt impregnated with silicone oil; the take-up mechanism advances the point of contact on the cleaning belt, thereby cleaning the upper roller and, at the same time, applying the silicone oil.

Step 9 Drum cleaning

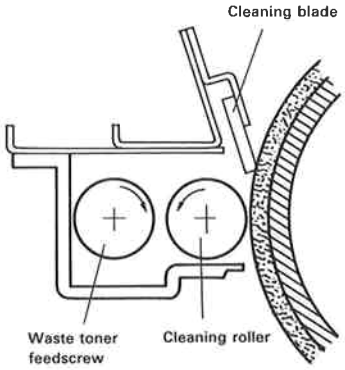

Figure 2-15

In this step, the toner remaining on the drum surface is scraped off by the cleaning blade and collected by the cleaning roller so as to prepare for the next copy cycle.

The toner so collected is forwarded by the waste toner feedscrew for collection inside the drum.

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II. AUXILIARY PROCESSES

1. Separation Claw

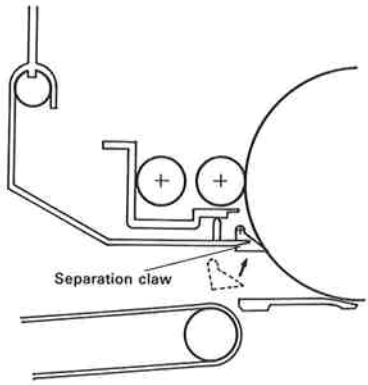

Figure 2-16

The copy paper can advance into the cleaning unit if not separated properly from the drum because of faulty pre-transfer or poor separation corona operation or owing to faulty paper feed. The separation claw is located at the bottom of the cleaning unit and serves to hook off the copy paper, preventing its advance into the cleaning unit.

2. Ozone Filter

The cooling and feeder fan units are equipped with ozone filters, which break down the ozone generated by the coronas into oxygen by catalytic action.

3. Static Charge Eliminator

Prior to delivery, copy paper has residual charge it has picked up during transfer. A grounded pad is provided at the exit of the delivery unit to serve as a static charge eliminator.

4. Blank Exposure Lamp

The blank exposure lamp serves to eliminate the drum surface potential over the non-image area, thereby preventing adhesion of excess toner on the drum.

The blank exposure lamp consists of an array of LEDs, which enables its coverage of the changing non-image area brought about by selection of differing reproduction ratios.

5. Charges in Feeder Unit

Part of the transfer corona current is sent to the electrode plate and led to the feeder guide plate. The feeder guide plate is grounded by way of a varistor, and the potential of the feeder guide is kept at about −1 kV. This arrangement serves to increase the static adhesion between the copy paper and the toner (positive) when the paper passes through the feeder unit, thereby preventing offset onto the fixing roller.

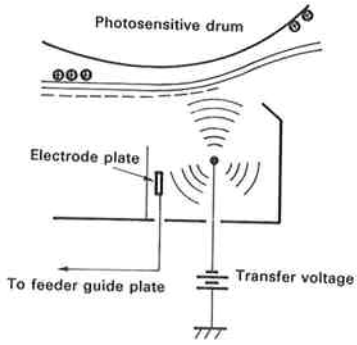

Figure 2-17

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CHAPTER 3

OPERATIONS AND TIMING

In outline diagrams, ——► represents mechanical drive paths, and ▮▮▮ indicates electrical signal paths.

Signals in digital circuits are identified as '1' for High and '0' for Low. The voltage of signals, however, depends on the circuit.

Nearly all operations of the copying machine are controlled by microprocessors. As the processors are not a part relevant to the serviceman's work, their internal operations are not described here. Further, as PCBs are not repaired at the user's premises, the operation of the circuits are explained by means of block diagrams rather than circuit diagrams.

For the purpose of explanation, circuits are divided into the following: from sensors to DC controller PCB input ports; from DC controller output ports to loads; miscellaneous control circuits and their functions.

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I. BASIC OPERATIONS

A. Functional Construction

The NP-3825 can be divided into four systems; i.e., paper pick-up and feeder system, exposure system, image formation system, and control system.

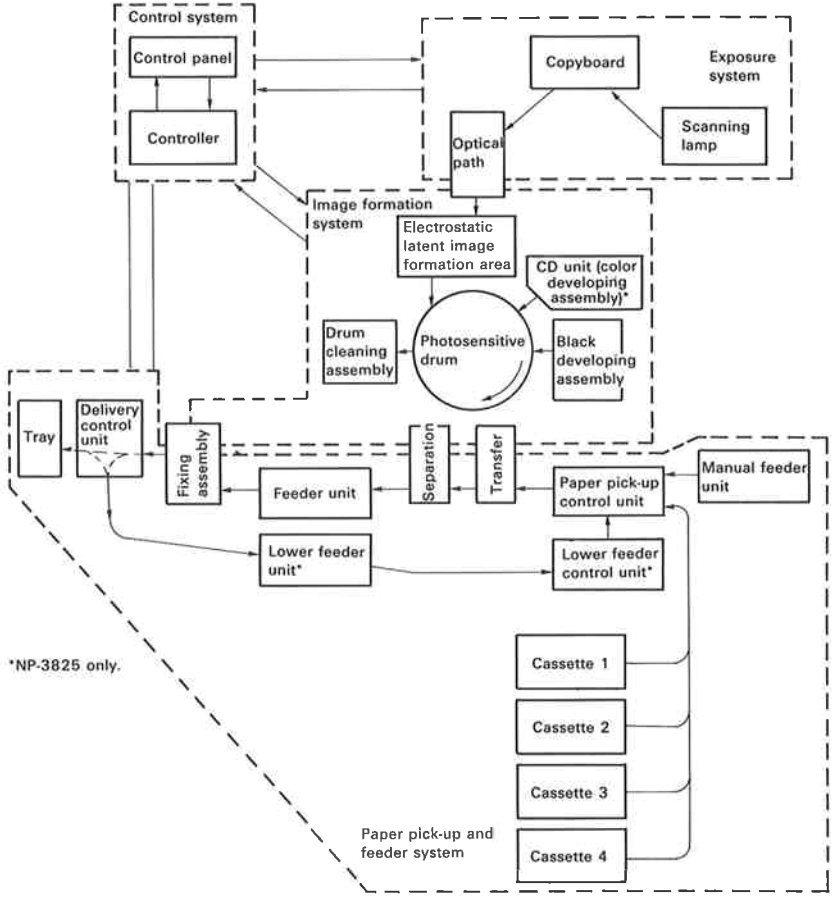

Figure 3-1

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B. Electrical Circuitry

The main electrical control of the copying machine is performed by three microprocessors on the DC controller. The main functions of each are as follows:

Microprocessors

Q101 (master CPU)
- Controls copy sequence

Q102 (slave CPU)
- Controls stepping motor

Q103 (slave CPU)
- Controls blank exposure lamp

The main functions of other ICs on the DC controller are as follows:

ICs

Q106 (I/O ports)

Q107 (gate array)
- Outputs clock pulses to CPU
- Expands ports of CPU
- Outputs pulses to CVR/HVT

Q108 (IPC)
- Communicates with document feeder, sorter, and editor (serial)

Q124 (PLL IC)
- Controls main motor

Q105 (SRAM)
- Memory for expansion

Q104 (EP-ROM)
- Memory for programs

Q109 (RESET IC)
- Resets upon power-on
- Resets after error condition

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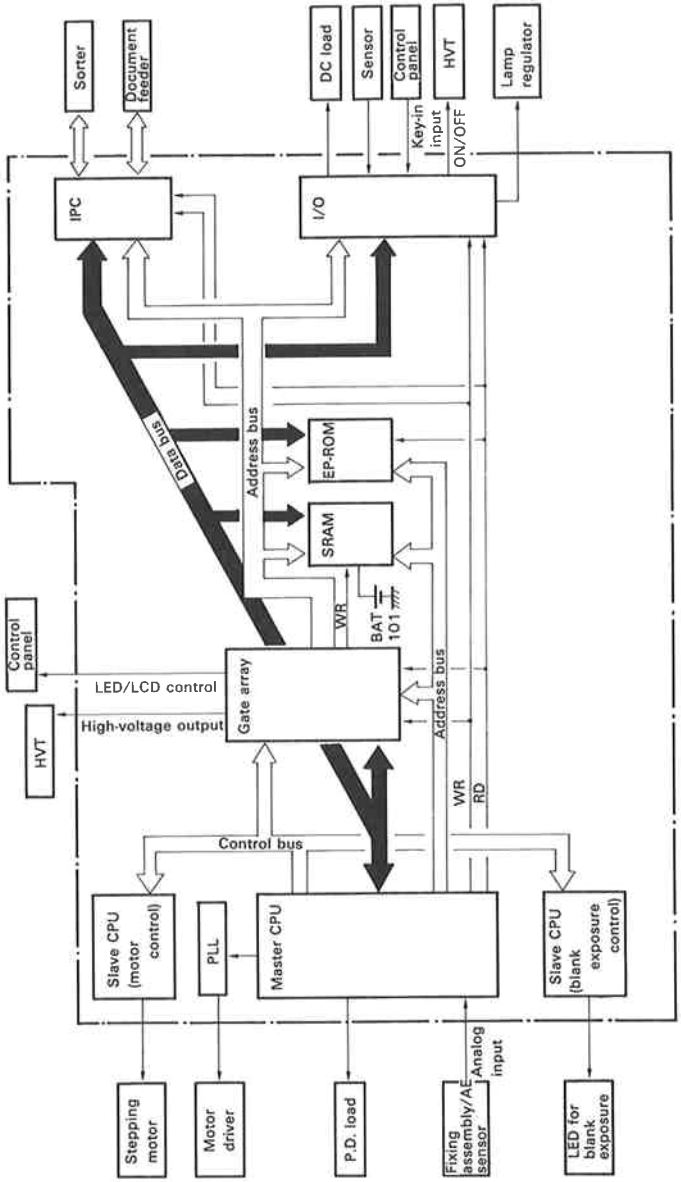

Figure 3-2

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C. Inputs to DC Controller

1. Inputs to DC Controller (1/3)

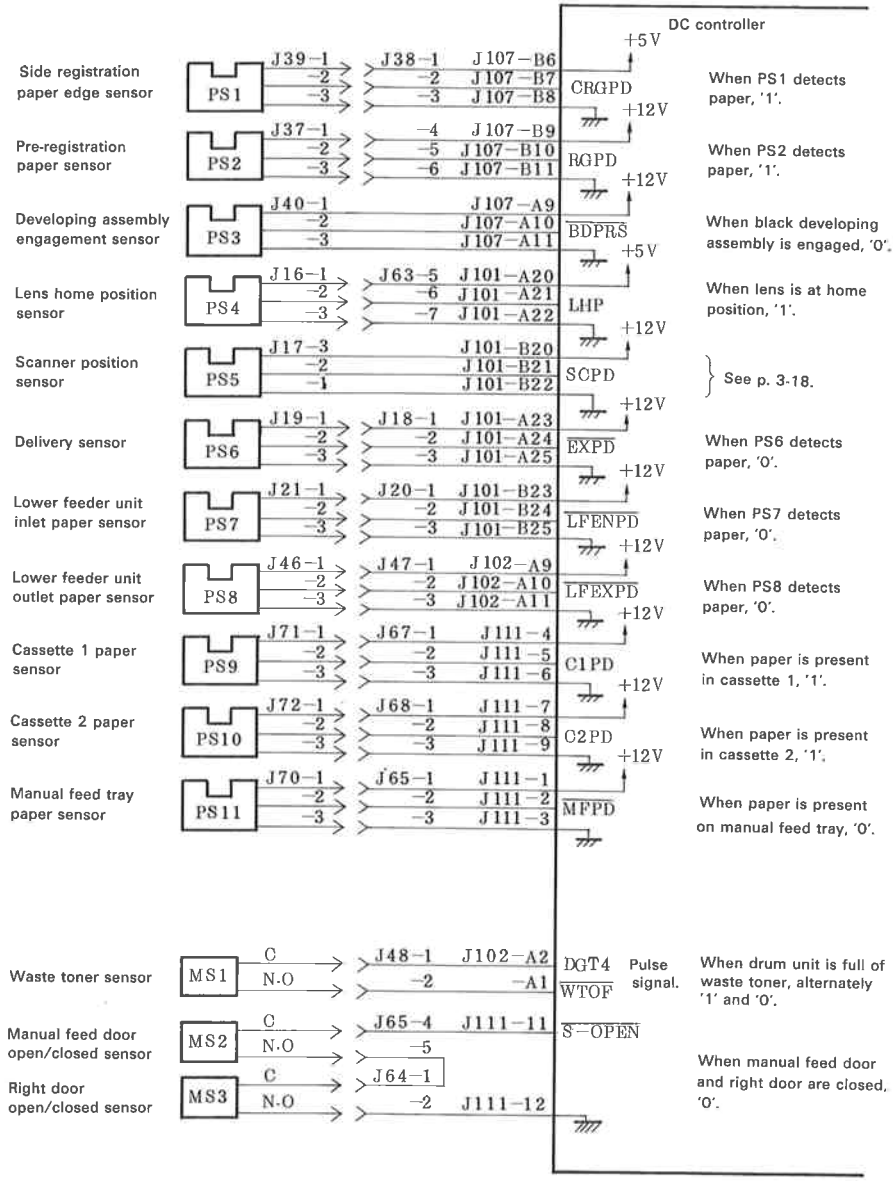

Figure 3-3

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2. Inputs to DC Controller (2/3)

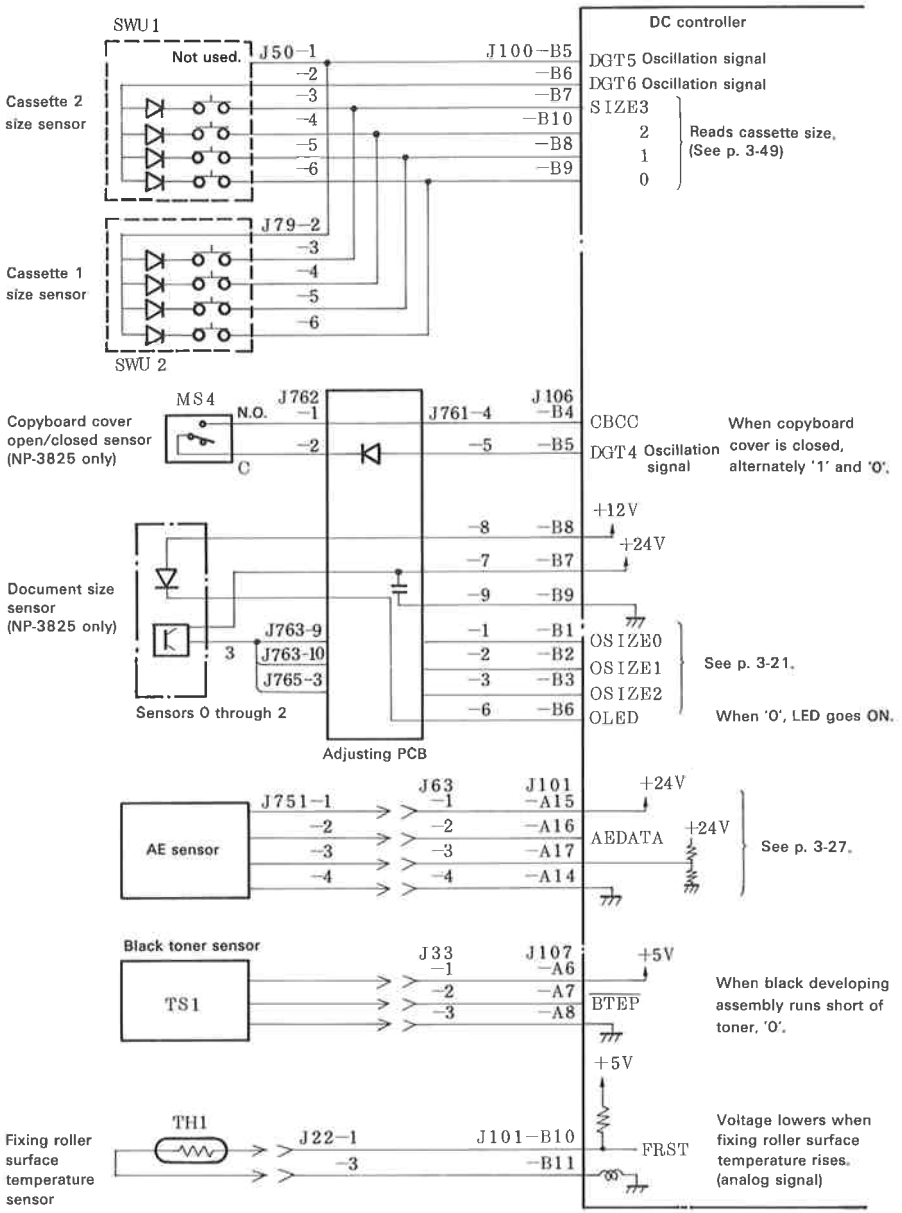

Figure 3-4

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3. Inputs to DC Controller (3/3)

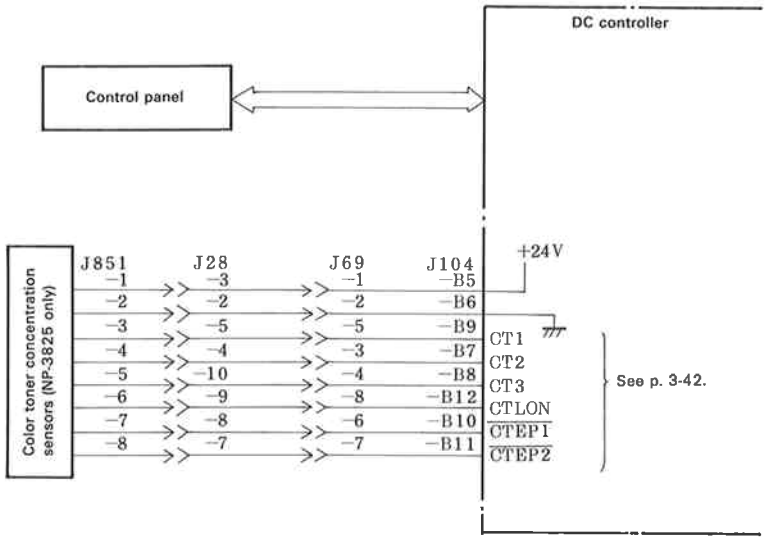

Figure 3-5

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D. Outputs from DC Controller

1. Outputs from DC Controller (1/4)

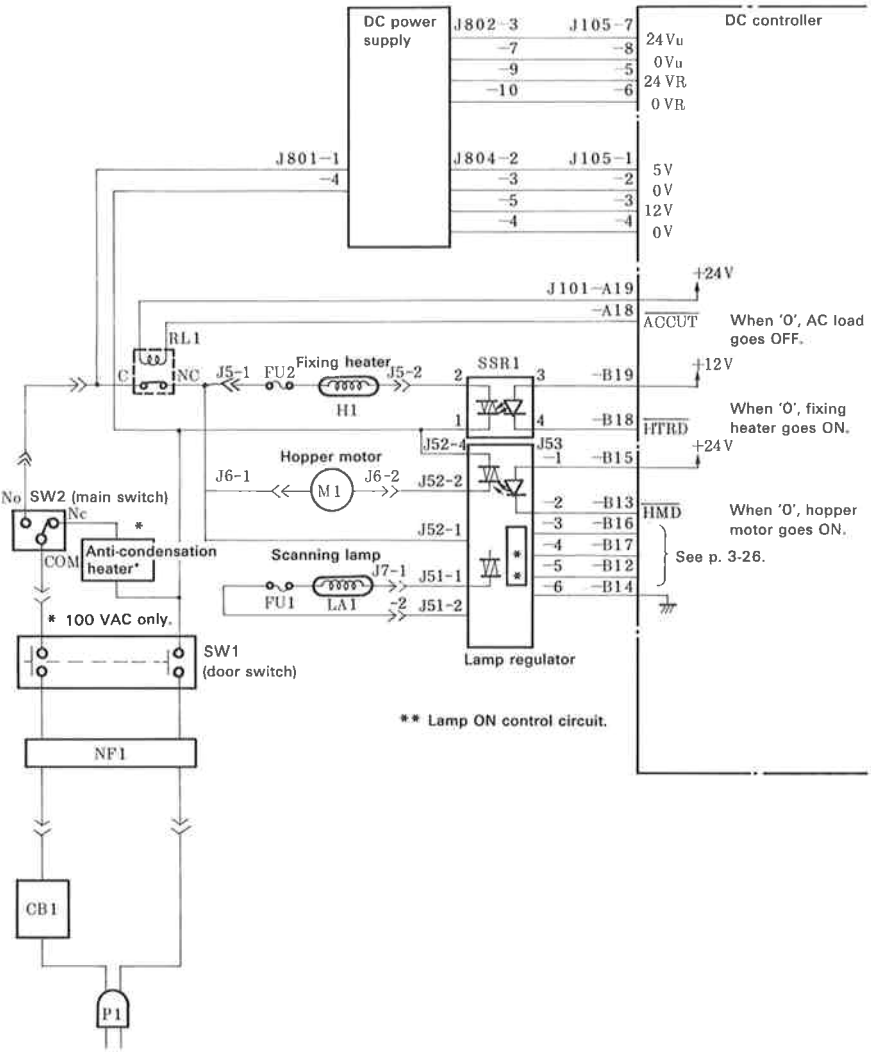

Figure 3-6

2. Outputs from DC Controller (2/4)

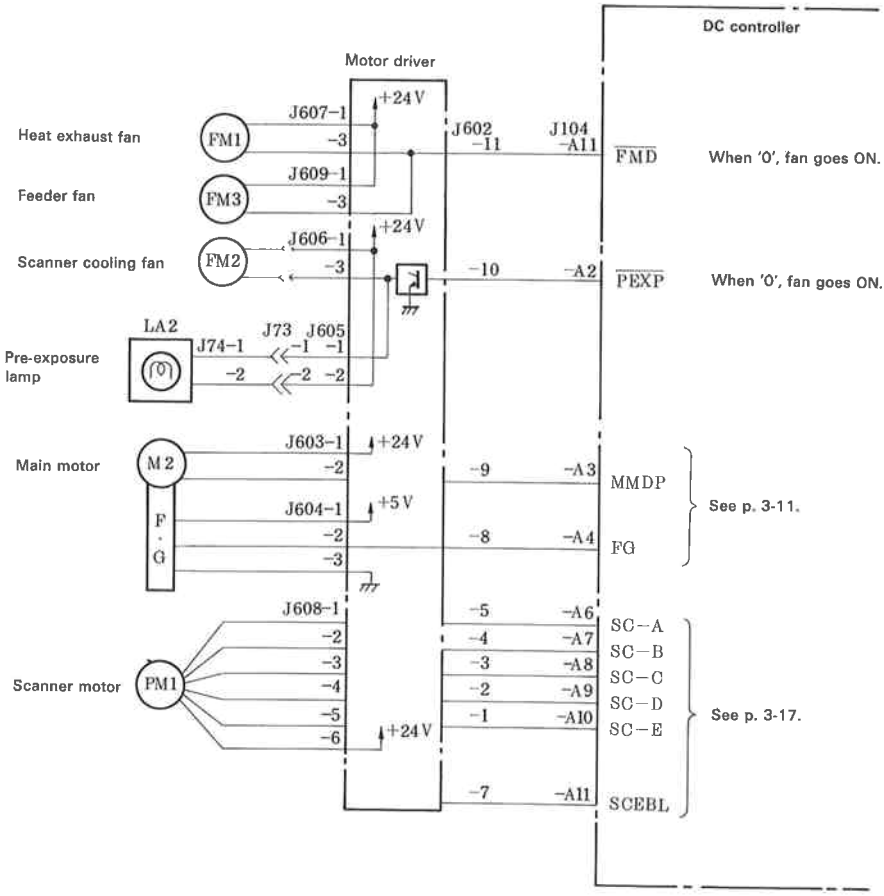

Figure 3-7

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3. Outputs from DC Controller (3/4)

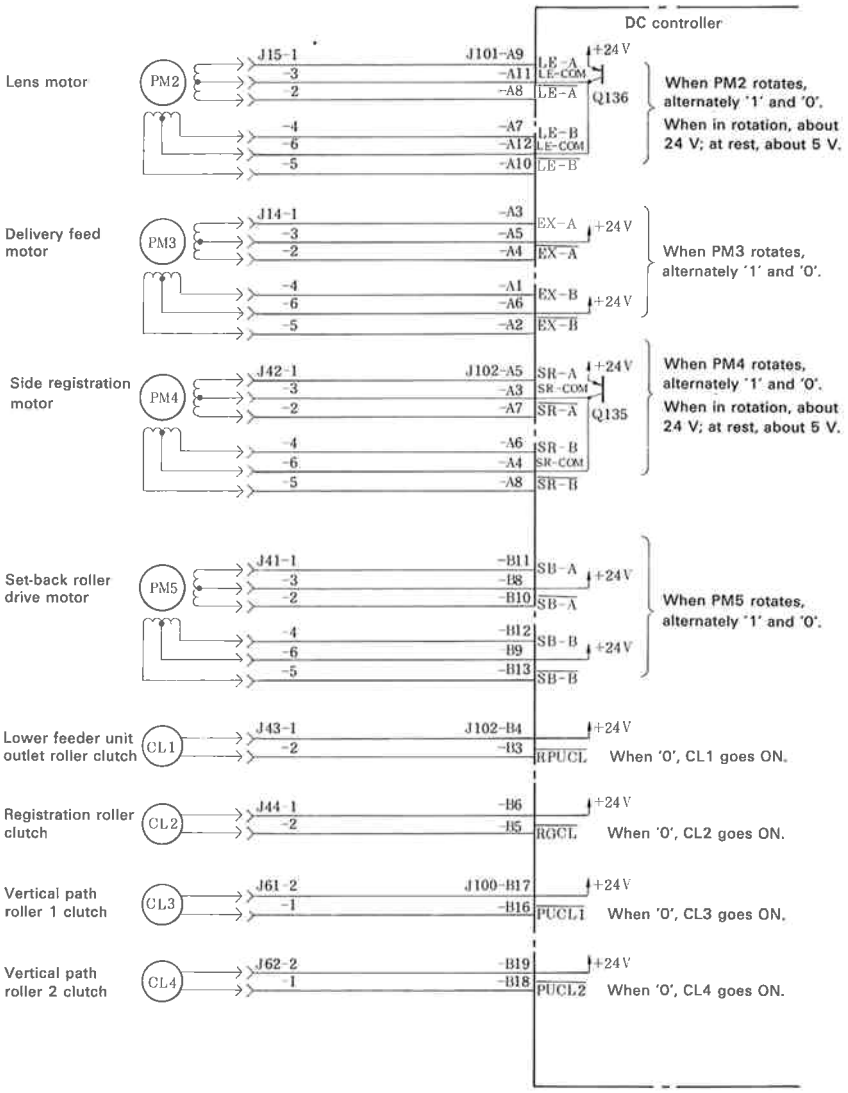

Figure 3-8

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4. Outputs from DC Controller (4/4)

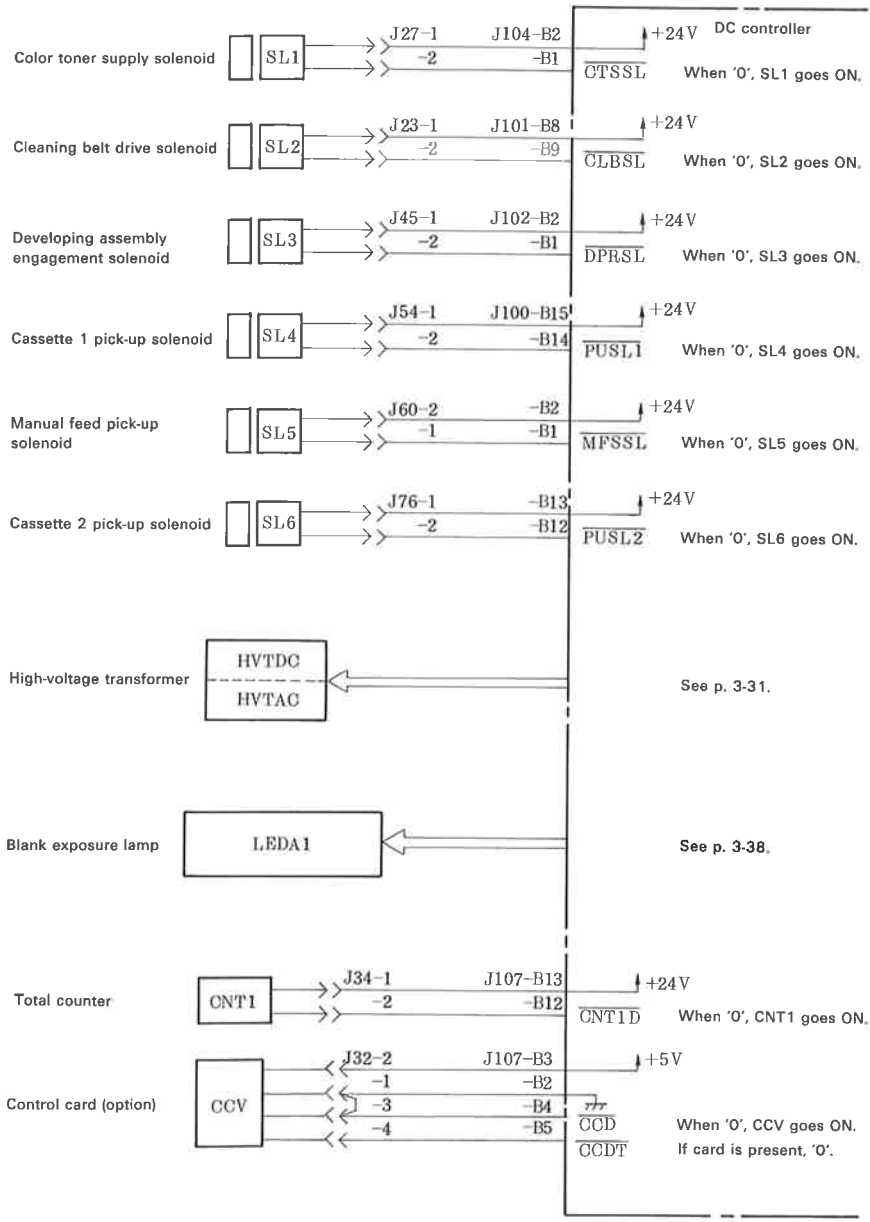

Figure 3-9

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E. Main Motor Control

1. Outline

The main motor (M2) is a DC motor and is used to drive the major mechanisms of the copying machine.

The circuit shown below is the main motor control circuit and has the following functions:

1) Turns main motor ON and OFF
2) Controls constant speed rotation

The main motor has a built-in FG (frequency generator) circuit and generates clock pulses of a frequency proportional to the revolution of the motor.

The main motor is controlled at a constant speed regardless of the reproduction ratio in effect by sending the clock pulses (FG signal) to the PLL IC (Q124) by way of feedback.

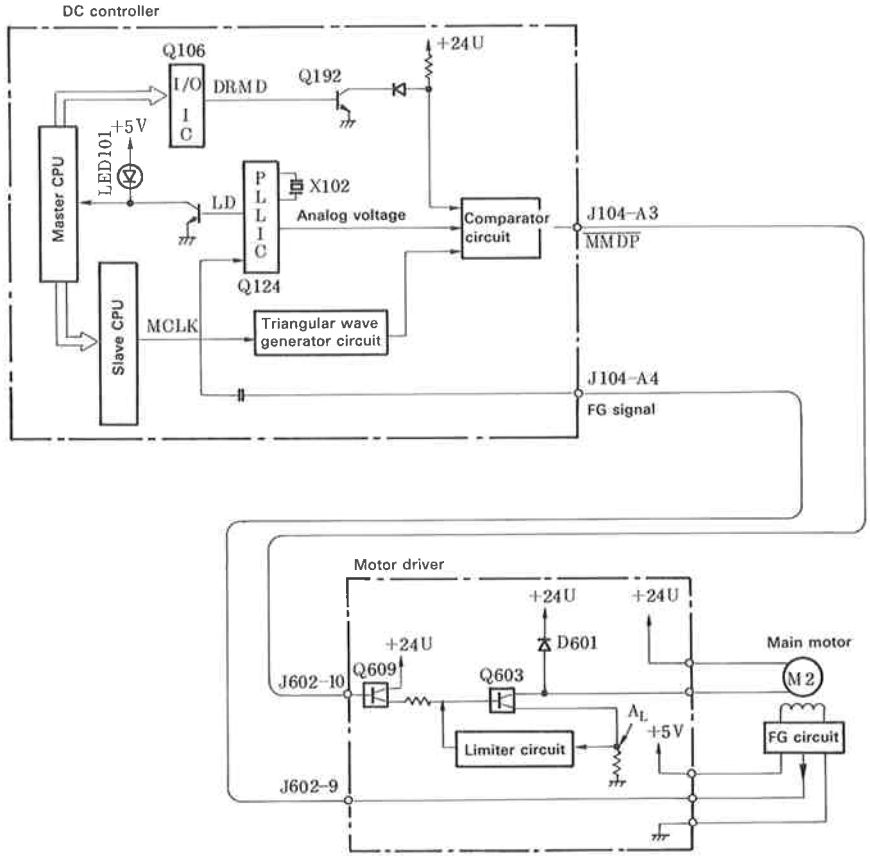

Figure 3-10

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2. Circuitry Mechanism

a) ON/OFF Control
The circuit operates as follows:

The I/O port IC (Q106) on the DC controller generates DRMD = 1.

⇩

A reference voltage is input to the comparator circuit.

⇩

MMDP (pulse signal) is output by the DC controller.

⇩

The main motor rotates.

b) Constant Speed Rotation
The circuit operates as follows:

The speed of the main motor changes.

⇩

The change is communicated to the DC controller in the form of an FG signal.

⇩

The FG signal and reference frequency is compared by the PLL IC, and an analog voltage suited to the difference is output.

⇩

The duty ratio between the triangular wave and analog voltage changes.

⇩

The period of application of voltage on the main motor changes.

⇩

The change in the speed of the main motor is compensated.

c) Protection Against Over-Current
If an over-current flows into the motor at time of start-up or motor lock, the circuit operates as follows:

The current flowing in the main motor increases.

⇩

Input current A_L to the limiter circuit exceeds 4.5 A.

⇩

Q603 goes OFF in response to the output from the limiter circuit.

⇩

Application of voltage on the main motor stops.

d) Abnormal Condition
LED101 remains ON while the main motor is rotating at the specified speed. If the rotation is not constant because of some abnormal condition, however, LED101 goes OFF; the signal to the main CPU then goes '1' and, if the condition lasts 1 sec or more, an error code will be indicated.

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F. Basic Sequence

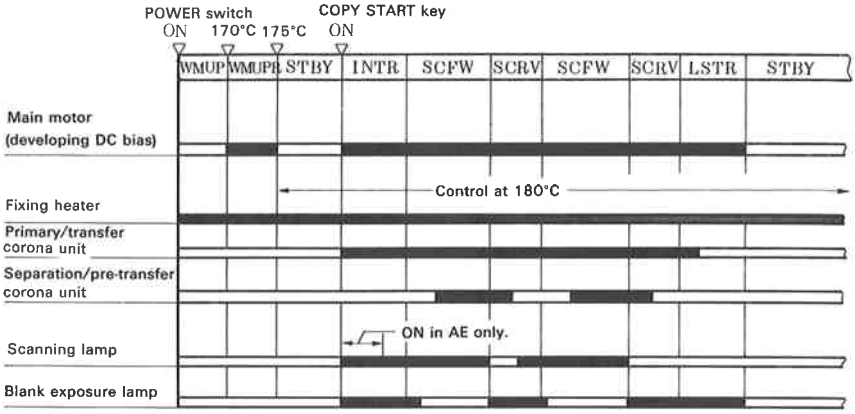

Figure 3-11

Signal	Period	Function	Remarks
WMUP (warm-up)	From power switch ON until fixing roller temperature reaches 170°C.	Allows fixing roller to warm up.	Warm-up time varies by initial fixing roller temperature.
WMUPR (warm-up rotation)	From when fixing roller temperature reaches 170°C until it rises to 175°C.	Maintains fixing roller temperature constant.	
INTR (initial rotation)	From when START key is pressed until scanner starts to move forward.	Stabilizes drum sensitivity in preparation for copy cycle.	
		Moves scanner forward and in reverse about 70 mm to measure document density.	AE mode only.
SCFW (scanner forward)	While scanner moves forward. • Forward distance varies by cassette size and reproduction ratio. • Forward speed varies by reproduction ratio selected.	Causes scanning lamp to expose document, and projects reflected light on OPC drum through mirrors and lenses.	Registration signal is generated, and copy paper is fed to transfer assembly.
SCRV (scanner reverse)	While scanner moves in reverse.	Returns scanner to home position in preparation for next copy cycle.	
LSTR (last-rotation)	From end of SCRV until about 0.8 sec after copy paper passes delivery sensor.	Cleans drum surface electrostatically to complete copy cycle.	Ensures delivery of last copy paper.
STBY (standby)	From end of LSTR until START key ON or power switch OFF.	Waits for input from START key or other operation key.	

Table 3-1

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II. EXPOSURE SYSTEM

A. Changing the Reproduction Ratio

The reproduction ratio across the drum is changed by the lens drive system; i.e., the zoom lens is moved to change the focal length and the ratio of distance between the document and lens and between the lens and drum.

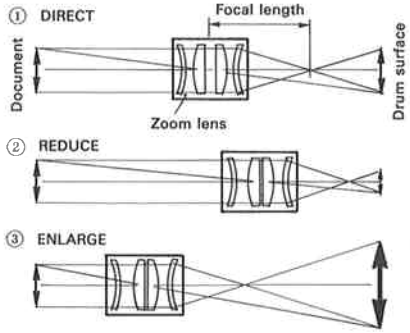

Figure 3-12

The reproduction ratio around the drum is changed by the scanner drive system; i.e., the ratio between the speed of forward movement of the scanner and rotation of the drum (image formation speed) is changed.

As the drum rotates at a constant speed, the reproduction ratio decreases when the scanner is moved faster.

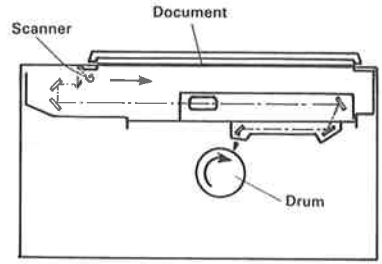

Figure 3-13

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B. Lens Drive System

1. Outline

The zoom lens of the copying machine is driven by a stepping motor (PM2). See Figure 3-14; the arrow indicates the direction of movement in the reduction mode.

The lens mount is in its home position when the signal plate blocks the phototransistor (PS4).

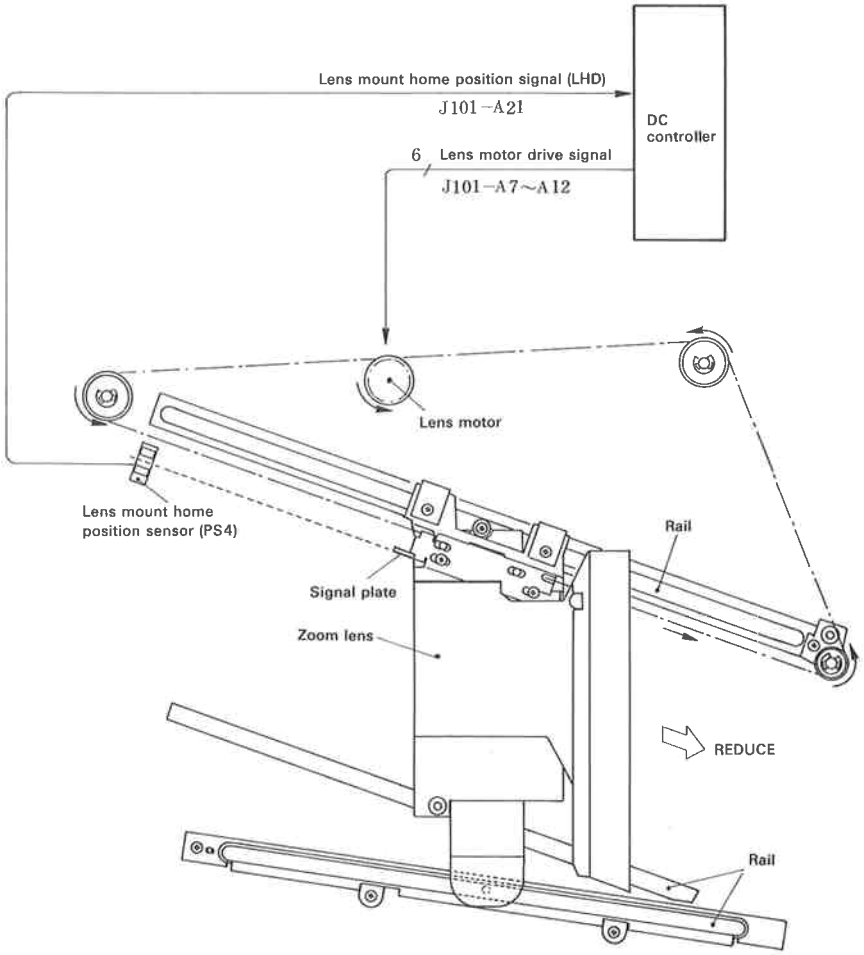

Figure 3-14

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2. Lens Motor Control

See Figure 3-15 for a diagram of the lens motor drive circuit.

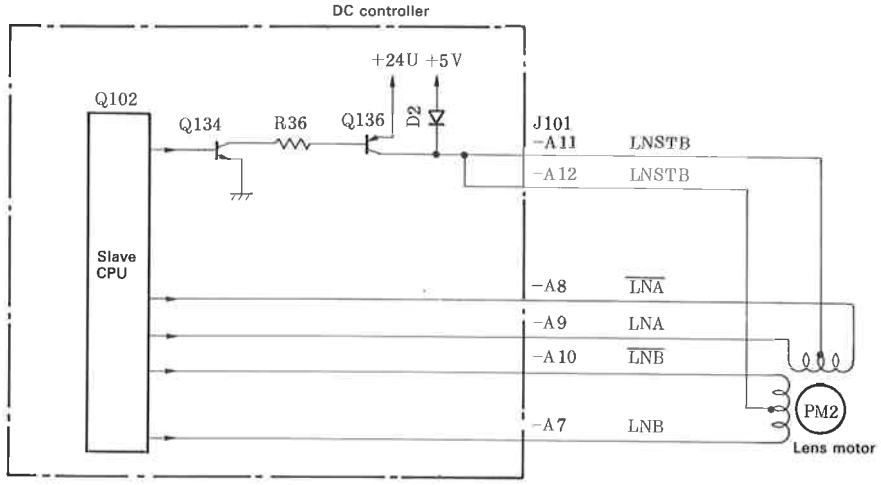

Figure 3-15

The lens motor is a stepping motor and rotates in response to the drive voltage (LNSTB) and pulse signals (LNA, $\overline{\text{LNA}}$, LNB, $\overline{\text{LNB}}$).

When the lens motor rotates, LNSTB is of 24 V; and sequential application of pulses to each phase drives the motor.

When the lens motor is at rest, LNSTB is of 5 V; the motor is supplied with retaining current so that the lens will not be displaced.

To compensate for the backlash of the drive gear, the lens is always moved to the REDUCE direction before it is stopped at a specified point.

This is true of the enlargement mode as well; the lens passes by the point of selection (reproduction ratio) first (to ENLARGEMENT), and thereafter the lens motor reverses (to REDUCTION) to stop the lens at the point of selection.

The sequence upon power-on is as follows:

POWER switch turned ON.

⇩

Scanner moved to home position.

⇩

Lens is moved to home position if located elsewhere.

⇩

Lens is set to DIRECT position. (lens motor stops upon generation of certain number of pulses after signal leaves lens home position sensor)

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C. Scanner Drive System

1. Outline

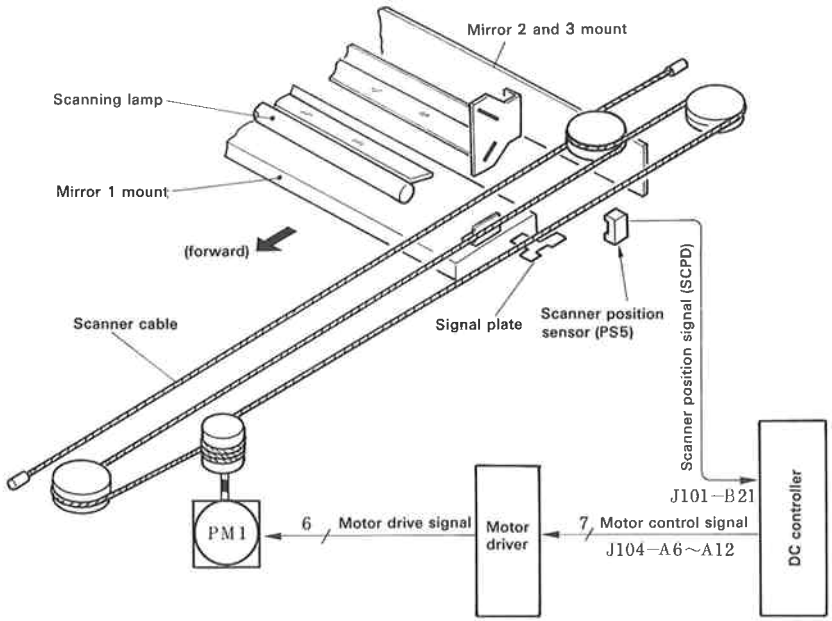

Figure 3-16

The scanner is driven by a stepping motor (MP1).

The scanner moves forward at different speeds to suit the reproduction ratios selected so as to change the reproduction ratios around the drum.

The scanner, on the other hand, moves in reverse about three times as fast as it moves forward in the direct mode.

The scanner home position and document leading edge are detected when the scanner position sensor (PS5) is blocked by the signal plate.

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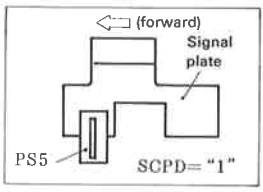
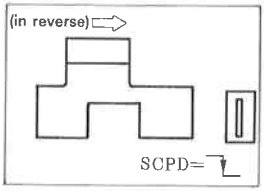
2. Detection by Scanner Home Position Sensor

The scanner position sensor (PS5) detects the scanner as shown below.

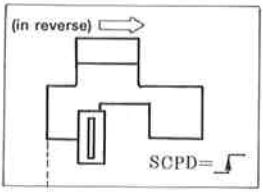
a. Home Position (power-on)

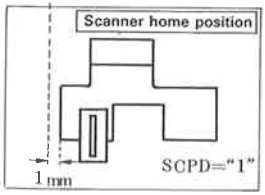


After power-on, the scanner moves forward and leaves the signal plate.



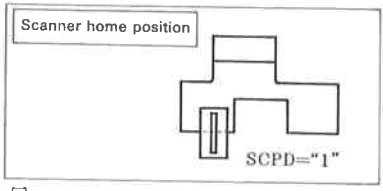
The scanner reverses when SCPD =

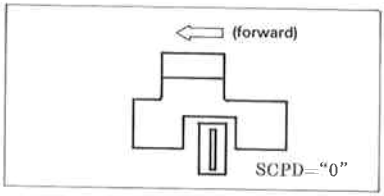


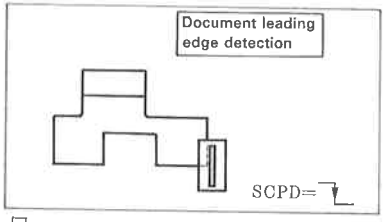


The scanner moves a further 1 mm from SCPD = and then stops.

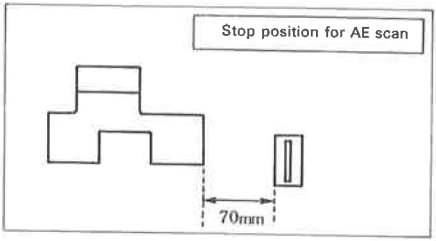
b. Document Leading Edge and Stop Position for AE Scan







■ Several seconds thereafter, the registration clutch goes ON (variable in service mode).



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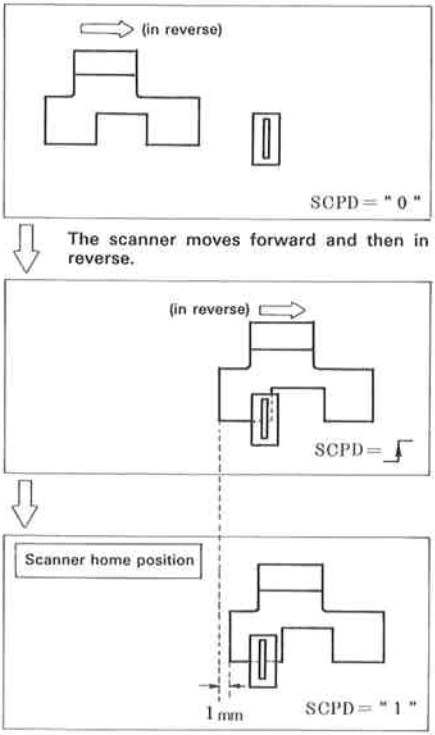
c. Home Position (scanner in reverse)



The scanner moves a further 1 mm and then stops.

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3. Scanner Motor Control Circuit

The scanner drive motor is a stepping motor and is rotated by a power supply of 24 V (SCEBL = 0) and each phase excitation signal (pulse) SC-A through SC-E.

If the scanning motor suffers a problem, SCEBL will go '1', and the motor is stopped.

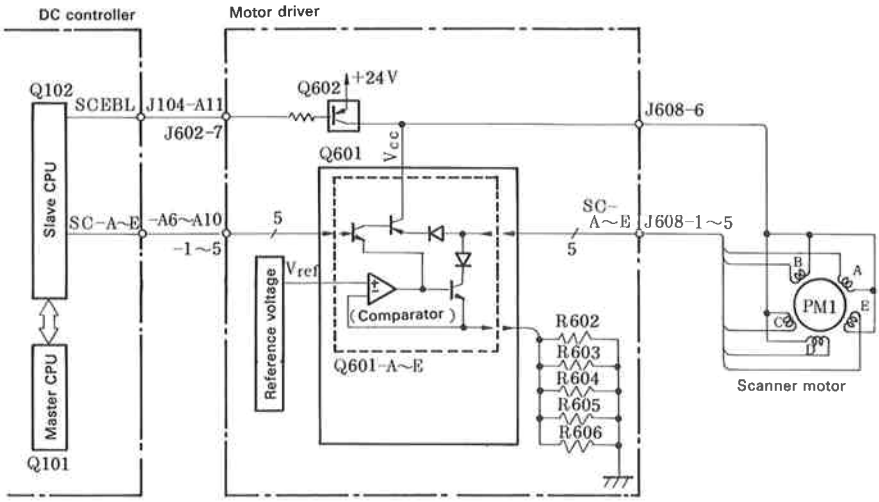

Figure 3-17

4. Scanner Operations Sequence

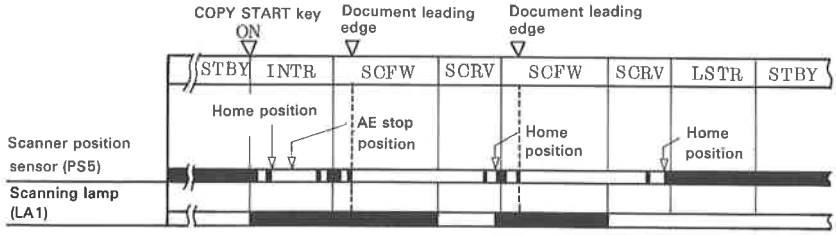

Figure 3-18

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D. Detection of Document Size (NP-3825 only)

1. Outline

The NP-3825 allows automatic paper selection and reproduction ratio selection; and, to this end, it is designed to detect the size of the document.

The copyboard glass is equipped with three sensors under it; and the DC controller identifies the size of the document based on the signals (1 and 0) coming from these sensors.

When the copyboard cover is brought down to about 30 deg., the microswitch (MS4) mounted at the rear of the NP-3825 is activated to initiate document detection.

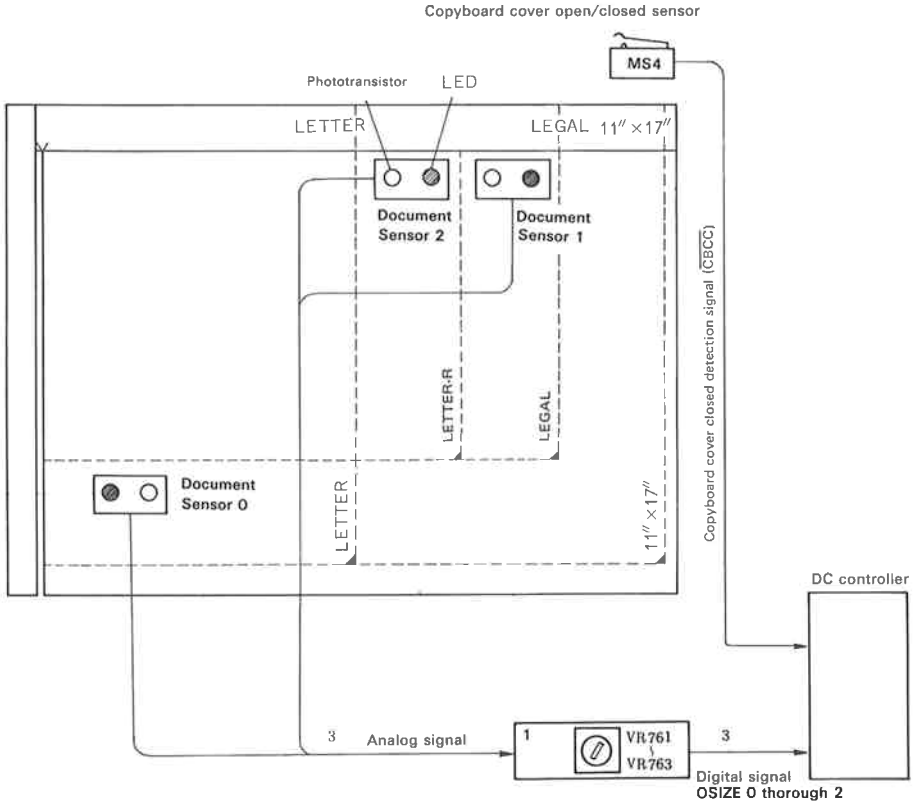

Figure 3-19

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2. Detection and Adjustment

The size of documents is detected as shown below.

Copyboard cover opened, and document placed. (MS4 is OFF).

⇩

LED on document sensor goes ON. Light reflected by document is detected by phototransistor.

⇩

Voltage (about 9 V to 15 V) suited to reflected light is sent by document sensor to adjusting PCB.

⇩

If input voltage VIN to comparator (Q761-2) is larger than reference voltage V2, comparator generates '1'.

⇩

Pulse signal is sent to DC controller when copyboard cover is closed and MS4 goes ON.

The volume needs to be adjusted when the sensor sensitivity adjusting PCB has been replaced.

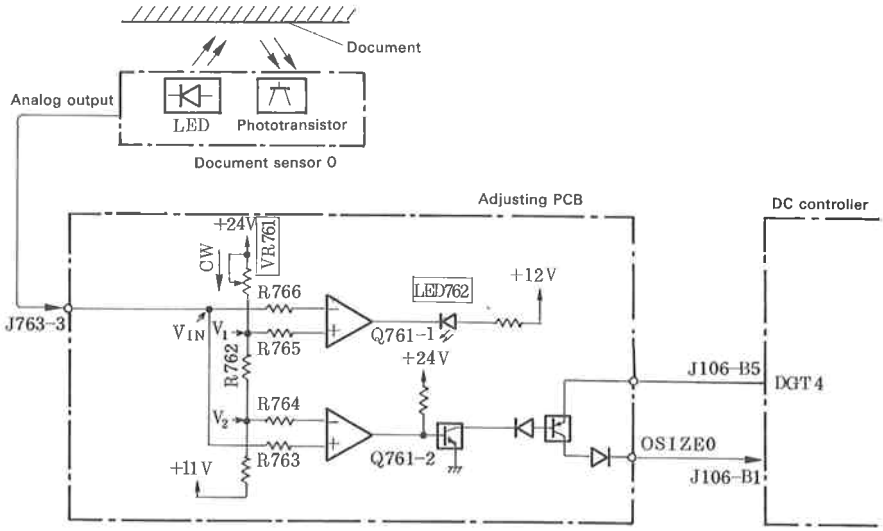

Figure 3-21

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3. Document Size

The DC controller detects the size of documents based on the document detection signals (OSIZE 0 through 2); see the table below.

Document detection signal			Size
OSIZE0	OSIZDE1	OSIZE2	
1	1	1	LDG
0	1	1	LGL
0	0	1	LTR-R
1	0	0	LTR
0	0	0	Mini

- 0: Document absent.
  1: Document present.
- Mini, if no sensor detects a document.

Table 3-2

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III. IMAGE FORMATION SYSTEM

A. Outline

The image formation system of the copying machine is constructed as shown and performs the following:

- Controls scanning lamp intensity
- Controls blank exposure lamp
- Controls primary/transfer corona current
- Controls pre-transfer/separation corona current
- Controls developing bias

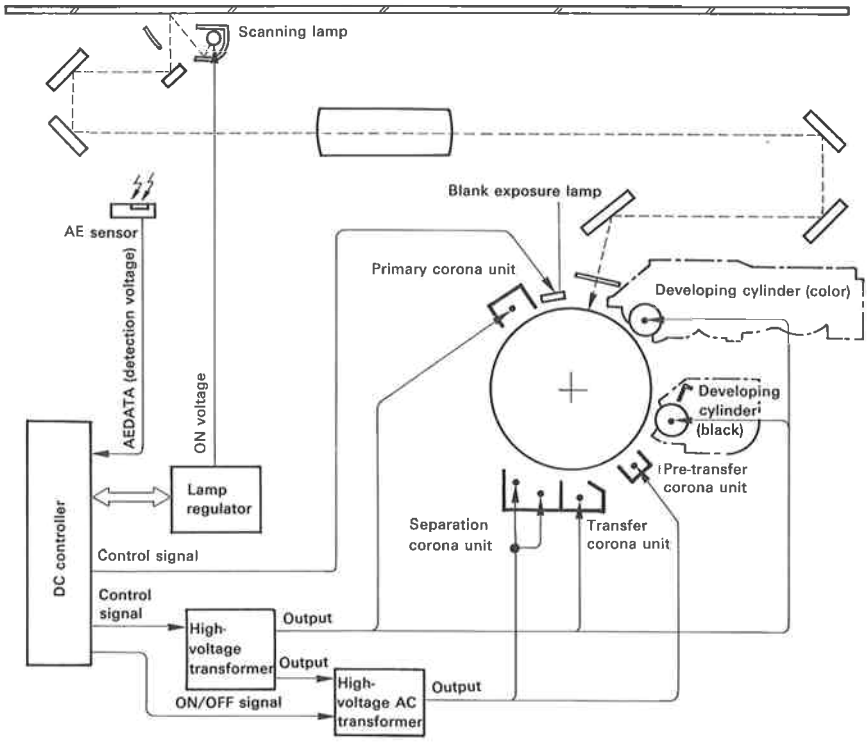

Figure 3-22

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B. Sequence for Image Formation

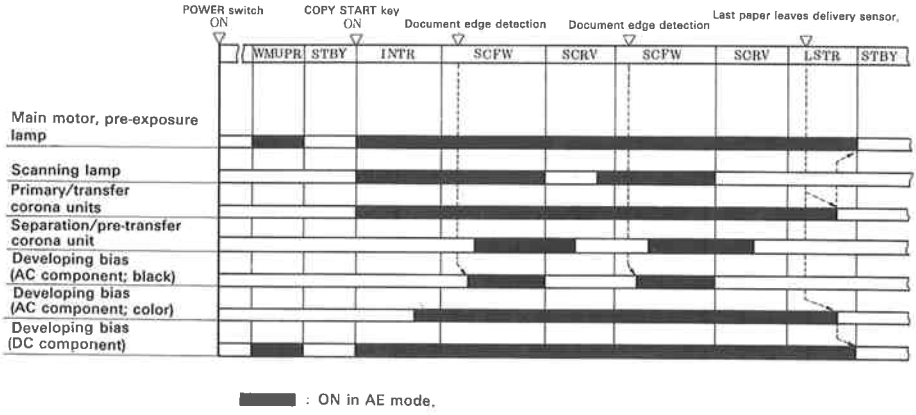

Figure 3-23

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C. Scanning Lamp Intensity Control

1. Outline

The scanning lamp intensity control circuit is arranged as shown and performs the following:

1) Turns the scanning lamp ON and OFF
2) Controls the scanning lamp intensity
3) Detects abnormal activation of the scanning lamp

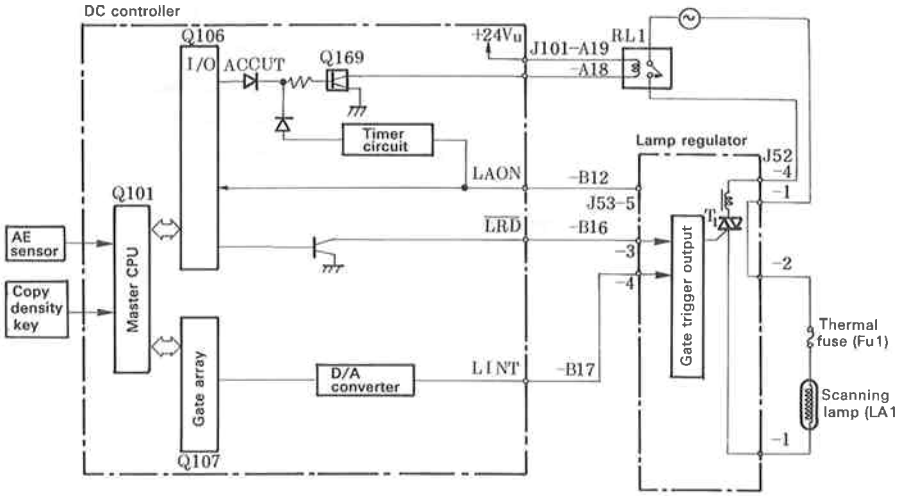

Figure 3-24

2. Circuit Operations

a. ON/OFF Control

DC controller outputs lamp regulator drive signal $\overline{LRD}$ = 0.

⇩

Triac (T1) in lamp regulator is ready to receive gate trigger voltage.

⇩

AC voltage controlled by LINT signal is applied to scanning lamp.

b. Intensity Control

The intensity signal (LINT) varies between 10 V to 16 V according to the setting by the copy density key or the density of the document (AE mode).

The intensity is controlled by this signal as follows:

LINT signal is sent to gate trigger output circuit in lamp regulator.

⇩

Trigger pulse suited to level of LINT signal is sent to triac (T1).

⇩

AC voltage supply to scanning lamp is controlled.

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c. Detection of Wrong Activation

The scanning lamp is monitored by means of the lamp ON signal (LAON).

If the scanning lamp remains ON for 1 sec or more despite $\overline{LRD} = 1$, ACCUT = 1 is output by the I/O port IC (Q106) to activate RL1 and cut the AC voltage supply to the scanning lamp.

If the microprocessor or lamp regulator is faulty and the scanning lamp remains ON for 20 sec or more, the problem is detected as follows:

The lamp regulator outputs LAON = 1 when scanning lamp goes ON.

⇩

If LAON = 1 lasts 20 sec or more, timer circuit outputs '1'.

⇩

Transistor Q169 goes ON, and relay RL1 goes ON.

⇩

Scanning lamp goes OFF.

3. Automatic Exposure Control (AE)

a. Outline

In the AE mode, the intensity of the scanning lamp is automatically controlled to suit the density of the document.

- The intensity under control is displayed on the copy density indicator on the control panel.

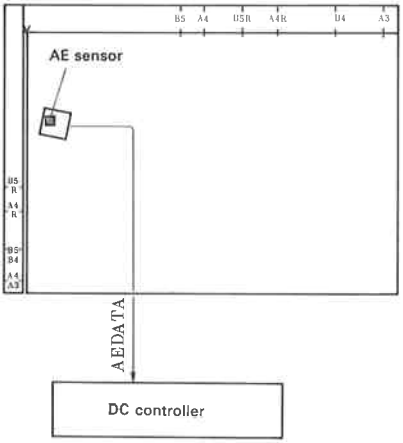

Figure 3-25

b. AE Mode and Scanner Operations

In the AE mode, the scanner operates as follows:

COPY START key is turned ON.

⇩

Scanning lamp goes ON.

⇩

Scanner moves forward to AE position when scanning lamp intensity stabilizes. (about 96 mm from home position)

⇩

AE sensor (photodiode) reads light reflected by document at AE position.

⇩ ■ Scanner returns to home position.

DC controller calculates optimum intensity for scanning lamp based on input value and send results to lamp regulator as intensity signal (LINT).

⇩

Scanning lamp goes ON at optimum intensity to expose document.

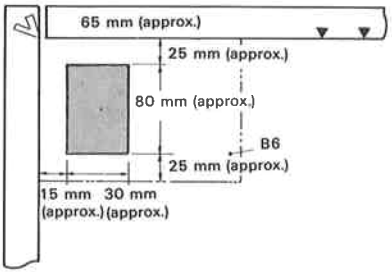

Figure 3-25A

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c. AE Control Circuit

The AE control circuit is arranged as shown in Figure 3-26 and operates as follows:

Light reflected by document enters AE sensor.

⇩

Output voltage of photodiode (Q751) is sent to DC controller as AEDATA (7 V to 10 V).

⇩

DC controller calculates optimum intensity for scanning lamp based on input value and send results to lamp regulator as intensity signal (LINT).

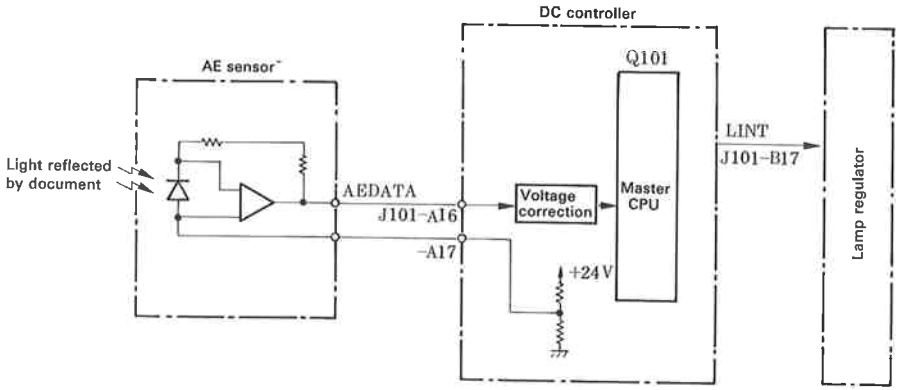

Figure 3-26

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4. Intensity and AE Adjustment

Table 3-3 is a tabular list of items that can be adjusted in the service mode on the scanning lamp intensity control circuit.

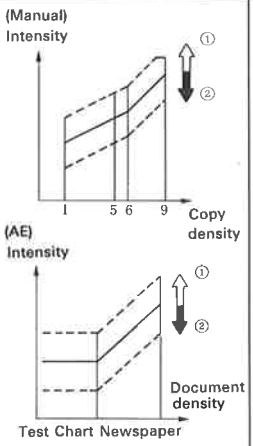
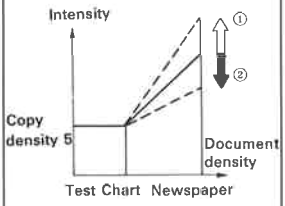
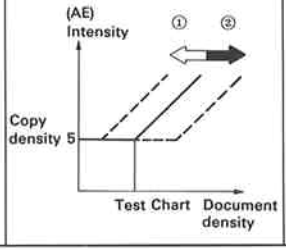
Item	Adjustment	Reference	Remarks
✻3✻ LIGHT	Optimum exposure Intensity for copy density 5		① If setting in service mode is high, intensity during copy cycle will increase, and copy density will decrease. ② If setting in service mode is low, intensity during copy cycle will decrease, and copy density will increase.
✻3✻ AE	Slope for AE control system		① If setting in service mode is high, density of newspaper copy will decrease. ② If setting in service mode is low, density of newspaper copy will increase.
✻3✻ AE-LIL	AE scanning intensity		① If setting in service mode is low, density of AE copy will ② decrease. If setting in service mode is high, density of AE copy will increase.

Table 3-3

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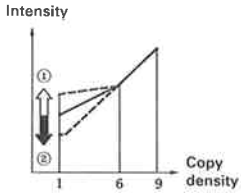
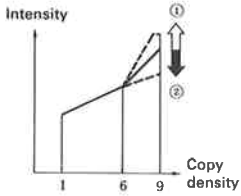
Item	Adjustment	Reference	Remarks
✻3✻ LIL-1	Slope for copy density 6 or less		① If setting in service mode is low, intensity will increase for copy density 6 or less. ② If setting in service mode is high, intensity will decrease for copy density 6 or less.
✻3✻ LIL-2	Slope for copy density 6 or more		① If setting in service mode is high, intensity will increase for copy density 6 or more. ② If setting in service mode is low, intensity will decrease for copy density 6 or more.

Table 3-3 (Continued)

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D. Primary/Transfer Corona Current Control

1. Outline

Figure 3-27 is a diagram of the primary/transfer corona current control circuit, which performs the following:

- Turns primary/transfer corona current ON and OFF
- Keeps primary corona current constant
- Switches transfer corona current values

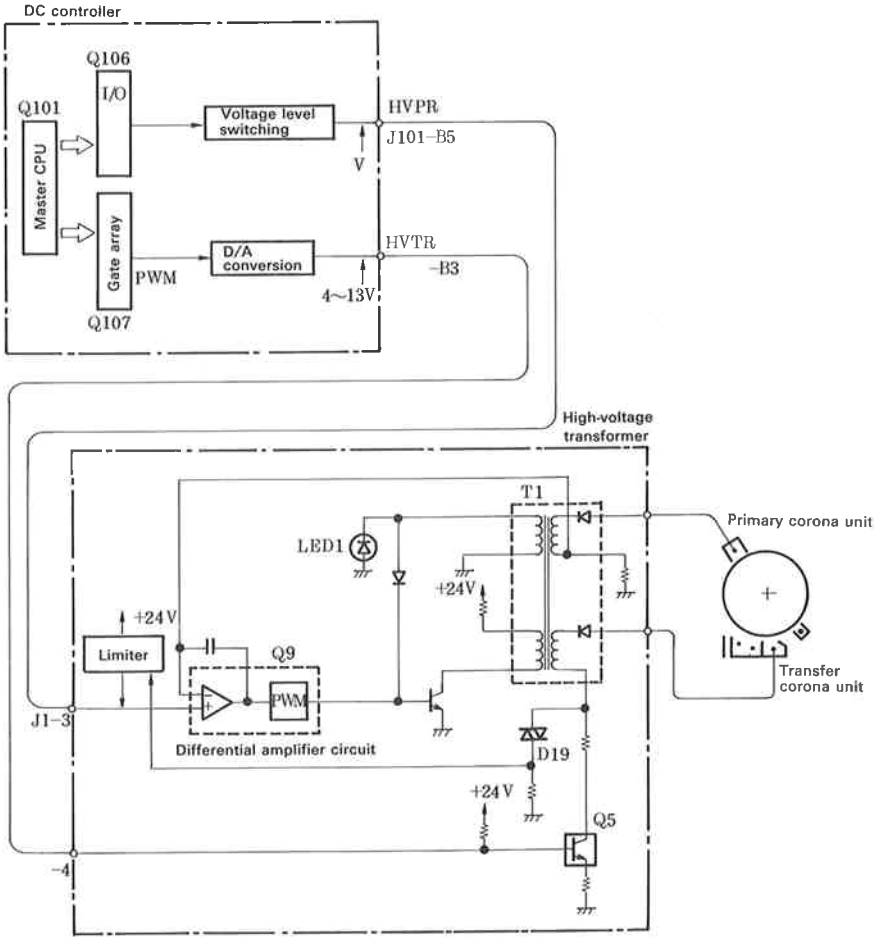

Figure 3-27

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2. Circuit Operation

a. ON/OFF Control

The primary/transfer current is turned ON and OFF by the primary corona level control signal (HVPR) and transfer corona level control signal (HVTR) sent by the DC controller.

HVPR assumes 14.7 V in response to output from I/O port IC.

⇩

PWM circuit sends pulse output.

⇩

Transformer (T1) goes ON.

- LED 1 goes ON.
- Primary corona current is output.
- Transfer corona current is output.

b. Constant Current Control

If environmental changes cause more corona current than that specified to flow from the primary corona, the level of the feedback signal to the differential amplifier circuit will be higher, resulting in a smaller output from the circuit; this way, the current is controlled to the specified value at all times.

If a corona current larger than that specified flows in the transfer corona unit, the diac (D19) goes ON, signals are sent to the limiter circuit, and the high-voltage output is put under control.

c. Transfer Corona Current Control

Two-sided and overlay copy operations bring about changes in the resistance of the copy paper; to deal with the changes, the transfer corona current is varied by the transfer corona level control signal (HVTR) generated by the DC controller.

Frequency of pulse output from gate array (Q107) of DC controller changes.

⇩

Level of HVTR changes.

⇩

- Voltage between emitter and collector of transistor (Q5) changes.

Output from transfer corona transformer varies between −558.8 μA through −151.6 μA.

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E. Separation/Pre-Transfer Corona Current Control

1. Outline

Figure 3-28 is a diagram of the separation/pre-transfer corona current control circuit, which performs the following:

- Turns the separation and pre-transfer corona current ON and OFF
- Keeps the separation and pre-transfer corona current constant
- Switches the separation corona current values

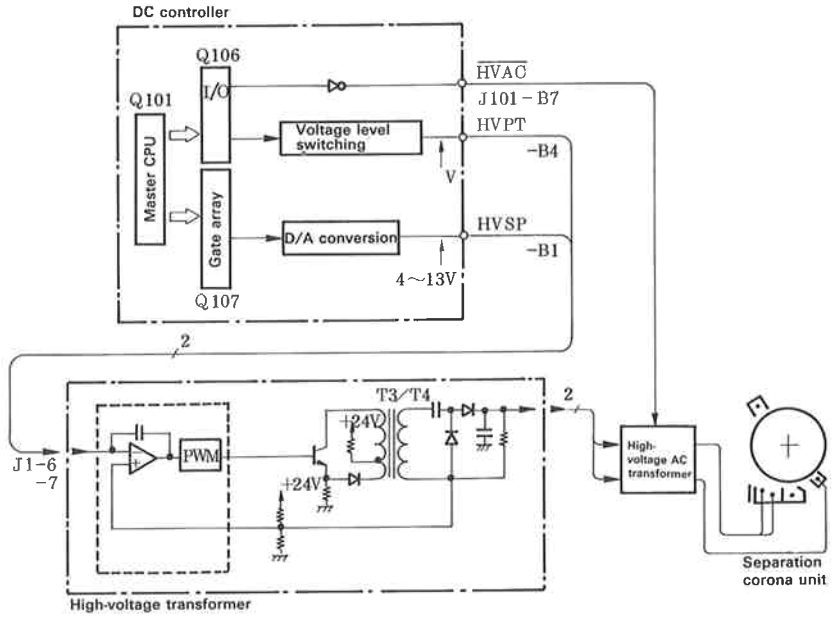

Figure 3-28

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2. Circuit Operations

a. ON/OFF Control

The separation and pre-transfer corona current is turned ON and OFF by the following three signals generated by the DC controller:

- Separation corona level control signal (HVSP)
- Pre-transfer corona level control signal (HVPT)
- AC transformer drive signal (HVAC)

HVPT assumes 10.6 V in response to output from I/O port IC, and HVSP assumes 4 V to 13 V in response to output from gate array.

⇩

PWM circuit generates pulse output.

⇩

Separation corona transformer (T4) and pre-transfer corona transformer (T3) are driven.

⇩

HVAC goes '0'.

⇩

High-voltage AC transformer is driven, and separation corona current and pre-transfer corona current are generated.

b. Constant Current Control

In addition to high-voltage primary output, control is performed in response to the level of the feedback signal from the transformer.

c. Separation Corona Current Control

Two-sided and overlay copy operations bring about changes in the resistance of the copy paper; to deal with the changes, the corona current is varied by the separation corona level control signal (HVSP) generated by the DC controller.

High-voltage AC transformer is driven, and separation corona current and transfer corona current are generated.

⇩

Level of HVSP changes.

⇩

Output from separation corona transformer (T4) is put under control.

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F. Developing Bias Control

1. Outline

Figure 3-29 is a diagram of the developing bias control circuit, which performs the following:

- Turns developing bias AC component ON and OFF
- Turns developing bias DC component ON and OFF
- Controls voltage level of developing bias DC component
- Varied in the service mode.

These control mechanisms are operated by the following two signals generated by the DC controller.

- Developing AC bias output signal ($\overline{\text{HVBAC}}$)
- Developing DC bias level control signal (HVBDC)

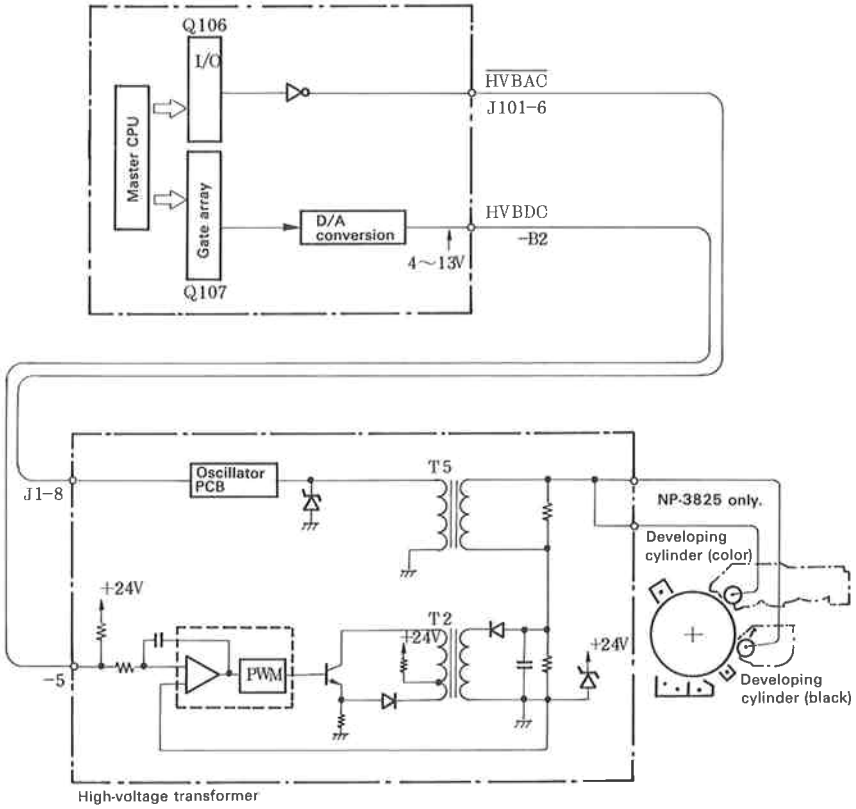
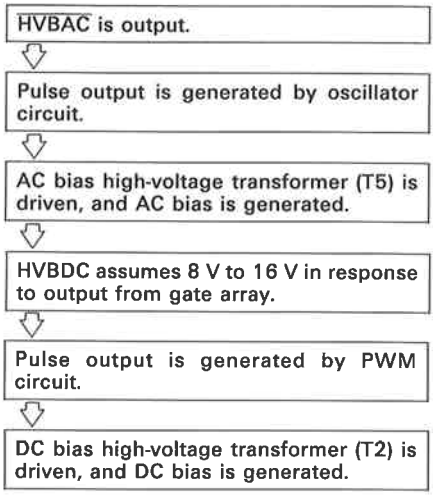


Figure 3-29

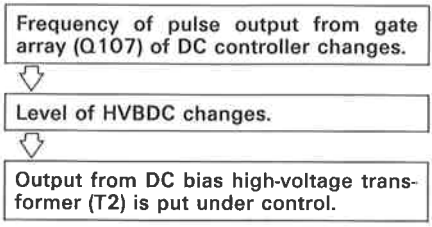
2. Circuit Operations

a. ON/OFF Control


HVBAC is output.
Pulse output is generated by oscillator circuit.
AC bias high-voltage transformer (T5) is driven, and AC bias is generated.
HVBDC assumes 8 V to 16 V in response to output from gate array.
Pulse output is generated by PWM circuit.
DC bias high-voltage transformer (T2) is driven, and DC bias is generated.

b. DC Bias Voltage Level Control

The level of the DC bias varies according to the setting made in the service mode.


Frequency of pulse output from gate array (Q107) of DC controller changes.
Level of HVBDC changes.
Output from DC bias high-voltage transformer (T2) is put under control.

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3. Adjustment

Table 3-4 is a tabular list of items that can be adjusted in the service mode on the developing bias control circuit. Be sure to return the copy density correction to its center value in the user asterisk mode (✻4✻) before adjustment.

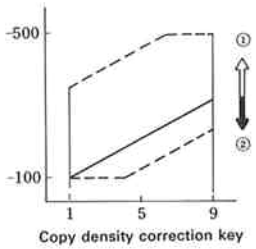
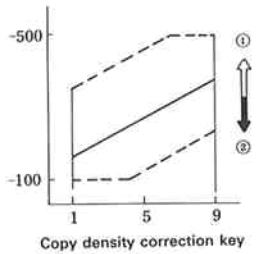
Item	Adjustment	Reference	Remarks
✻3✻ DCB-B	Developing bias (DC component; during black copying)		① If setting in service mode is high, DC component of developing bias during black copying will increase, and copy density will decrease. ② If setting in service mode is low, DC component of developing bias during black copying will decrease, and copy density will increase.
✻3✻ DCB-C	Developing bias (DC component; during color copying)		① If setting in service mode is high, DC component during color copying will increase, and color copy density will decrease. ② If setting in service mode is low, DC component of developing bias during color copying will decrease, and color copy density will increase.

Table 3-4

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G. Blank Exposure Lamp

1. Outline

The blank exposure lamp exposes sections (non-image area) of the drum to eliminate drum surface potential according to copying conditions.

The lamp consists of an array of 124 LEDs, and all 124 LEDs go ON as long as the document is not exposed and while the drum is rotating.

While the document is exposed, the lamp is controlled according to the copy size, copy mode, and reproduction ratio.

The two LEDs each at the ends (sharp-cut LED) are turned ON and OFF by the static method, and they remain ON as long as the drum is rotating. The rest of the LEDs are arranged in the form of a matrix and are turned ON and OFF by the dynamic method.

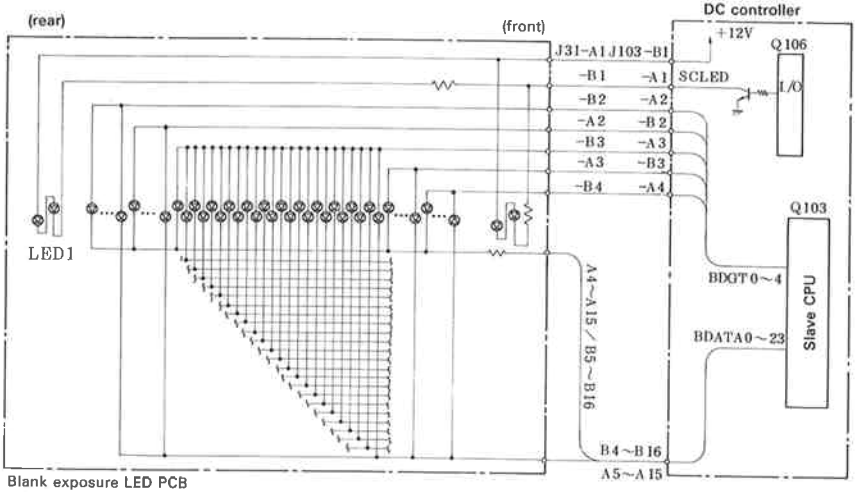

Figure 3-30

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2. Turning the LEDs ON

a. REDUCTION

Regardless of the cassette size, the number of LEDs (rear) suited to the reduction ratio are turned ON to expose the document so as to black out the non-image area of the document.

For a reproduction ratio of 90%, for example, the 15 LEDs starting at the rear are turned ON.

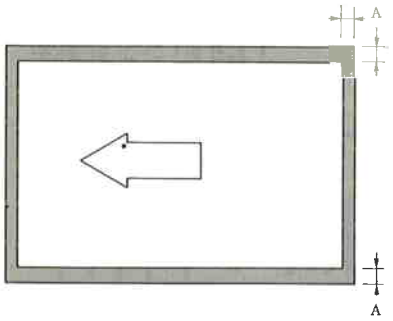
b. DIRECT

The number of LEDs suited to the cassette size are turned ON to expose the document so as to black out the section of the drum not in contact with the copy paper.

c. FRAME ERASING

When frame erasing is activated, LEDs are turned ON so that the sides of the copy paper about 7 mm in width will be free of toner.

Note:
Frame erasing in the manual feed mode will be performed as if A3 copy paper has been selected.
Sheet erasing without specifying the paper size and using a universal cassette will be performed as if the largest copy paper that can be set in the cassette has been selected.



A = 7 mm (approx.)

Figure 3-31

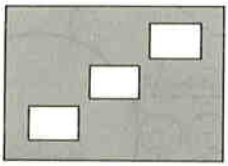
d. Area Designation and Color Conversion (NP-3825 only)

The LEDs are turned ON to expose the document according to the dimensions and location of the designated area and color conversion mode settings.

For instance, making a copy (B) of a document (A) of Figure 3-32 in the area designation and color conversion modes will cause the LEDs to go ON in numbers that prevent adhesion of toner over the shaded area.

Document (A) Copy (B)

Figure 3-32



LEDs to go ON

Figure 3-33

To copy the document shown in Figure 3-32 with its C, E, and G in black and the rest in red in the image conversion mode, the document is exposed twice in the overlay mode.

During the first exposure, the LEDs over the shaded area of Figure 3-33 are turned ON for black development.

During the second exposure, LEDs over the shaded area of Figure 3-34 are turned ON for red development (overlay).

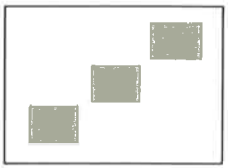


Figure 3-34

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H. Developing Assembly and Cleaning Unit

1. Outline

The black developing assembly and CD unit are brought into contact or moved away from the drum by the black developing assembly engagement clutch.

The rotation of the black developing assembly and CD unit is driven by the main motor by way of the drum gear.

The waste toner scraped by the cleaning blade is carried into the OPC drum for collection.

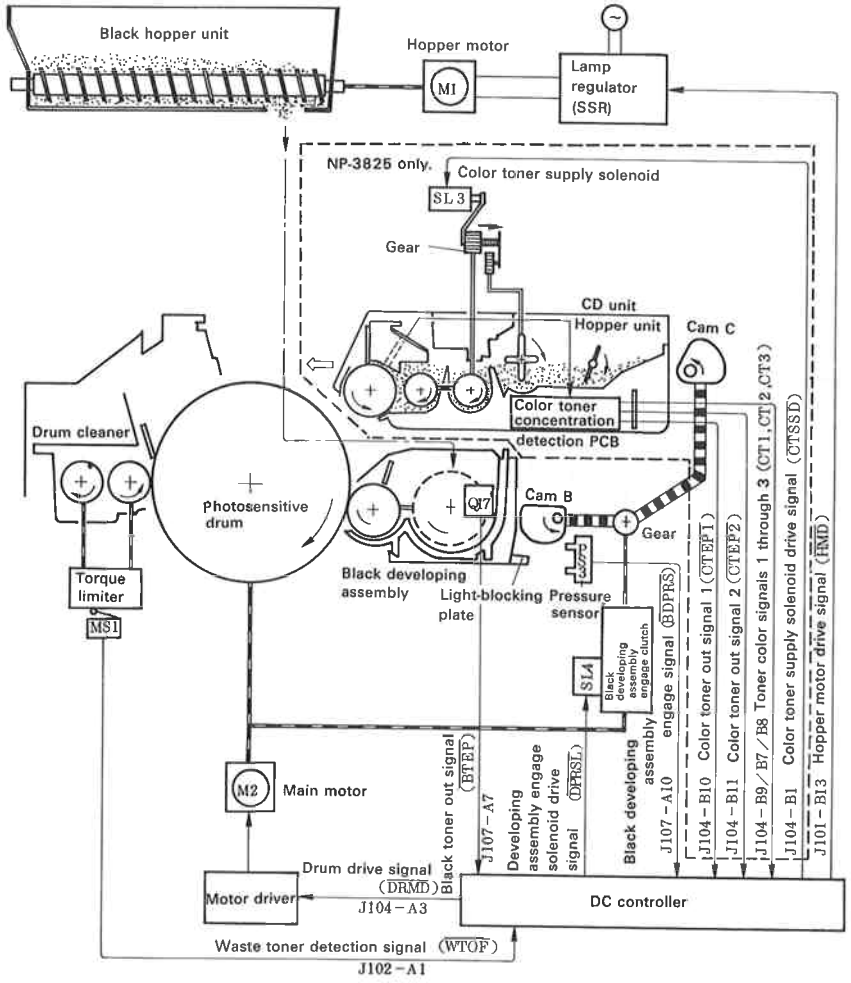

Figure 3-35

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2. Black Toner Detection and Supply

The amount of toner inside the black developing assembly is monitored by the toner sensor (TS1).

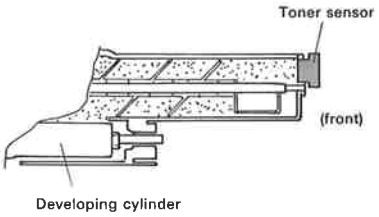
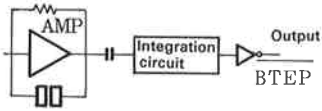


Figure 3-36 (top view)

The toner sensor used inside the black hopper unit is equipped with an oscillator which, in the absence of toner, oscillates at several kHz and causes the sensor output to go '0'. In the presence of toner, the weight of the toner stops its oscillation, and the sensor output goes '1'.



Pie 30 electric

Figure 3-37

The toner detection and supply mechanisms operate as follows:

Black toner inside black developing assembly runs short.

⇩

Toner sensor output will be $\overline{BTEP} = \_\lceil\_$.

⇩

2.5 sec thereafter, hopper motor rotates to send toner from hopper unit to black developing assembly.

⇩

Toner sensor output will be $\overline{BTEP} = \_\lfloor\_$.

⇩

1.0 sec thereafter, hopper motor stops.

The detection is synchronized with the main motor (black copying only).

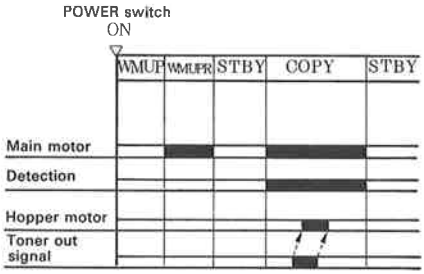


Figure 3-38

- The toner stirring screw inside the black developing assembly is driven by the main motor. For this reason, the hopper motor is designed to rotate only when the main motor rotates; rotation of the hopper motor while the main motor is at rest can lead to clogging by toner.

When the hopper runs out of black toner, the operations will be as follows:

$\overline{BTEP} = \_\lceil\_$ causes the hopper motor to rotate.

⇩

The hopper motor continues to rotate as $\overline{BTEP} = \_\lfloor\_$ does not come about.

⇩

Copy operation ends, and hopper stops. (*a* sec after BTEP = $\_\lceil\_$)

⇩

Next copy operation starts. BTEP = 0 causes hopper motor to rotate.

⇩

b sec after copy operation starts and when $a + b = 60$ sec, hopper motor stops.

⇩

Copy run for paper fed ends, and a warning message is indicated on control panel.

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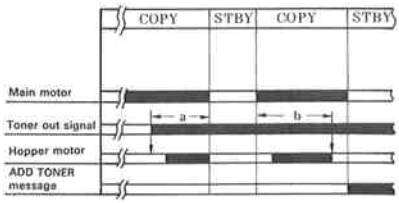

Figure 3-39

3. Color Toner Concentration Detection (NP-3825 only)

a. Outline

The toner concentration sensor consists of a lamp and photodiode; it lights the developer on the developing cylinder, and the reflected light is measured and expressed in terms of developer concentration.

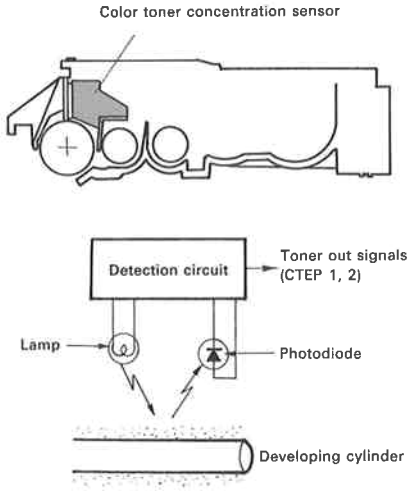

Figure 3-40

The color of the toner in the CD unit is identified by the DC controller using the toner color signals from the color toner concentration detection circuit; see Table 3-5.

Cut the jumper wires (JP851 through JP853) on the color toner concentration detection circuit according to the CD unit used when installing the unit.

Signal	Red	Blue	Green	Brown	CD unit out
Toner color signal 1 (CT1)	0	1	0	1	1
Toner color signal 2 (CT2)	0	0	1	1	1
Toner color signal 3 (CT3)	0	0	0	0	1

Table 3-5

b. Color Toner Concentration Detection Circuit

1) Outline

The developer inside the CD unit consists of color toner and carrier. As copies are made, only the color toner is drawn to the drum and, as such, the developer grows darker and darker as more copies are made (carrier being black in color). The fact enables detection of the amount of color toner with reference to the concentration of the developer.

2) Operations

The toner concentration is identified by comparing the light coming directly from the lamp and that reflected by the developing cylinder. The method enables detection of toner concentration independent of variations in the lamp intensity.

The operations to this end are as follows:

Color toner is consumed, and toner concentration lowers.

⇩

Reflected light decreases, and output from operation amplifier (Q851-2) decreases.

⇩

Level of V_A through V_D lowers.

⇩

When $V_{ref} > V_C$, C $\overline{CTEP1}$ = 0 is output.
When $V_{ref} > V_A$, C $\overline{CTEP2}$ = 0 is output.

⇩

Toner is supplied from hopper inside CD unit.

■ For toner supply in response to the toner out signal (CTEP1, 2), see p. 3-44.

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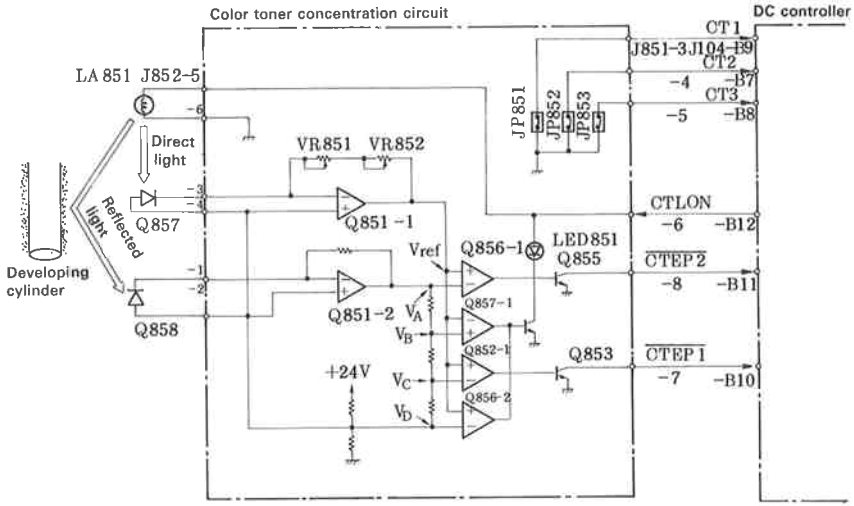


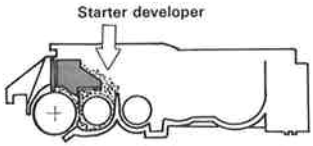
Figure 3-41

3) Setting of Reference Voltage (Vref)

It is necessary to set the output voltage (Vref) caused by direct light to the reference voltage during installation of the CD unit.

- Serviceman pours starter developer.

Developing cylinder receives developer of optimum concentration.



Output voltage (V_A through V_D) by direct light assumes level corresponding to optimum concentration.

- Serviceman adjusts VR851 (rough) and VR852 (fine).

$V_B > V_{ref} > V_D$.

LED851 goes ON.

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c. Color Toner Supply

The CD unit supplies toner according to the output of the toner out signals (CTEP1, 2).

CTEP1: When toner is consumed in small amounts; copy operation starts immediately thereafter.

CTEP2: When toner is consumed in large amounts; idle rotation is performed so as to mix the toner and carrier.

When the concentration of the developer lowers below the specified value, the color toner supply solenoid (SL3) goes ON to supply toner from the hopper inside the CD unit to the cylinder unit.

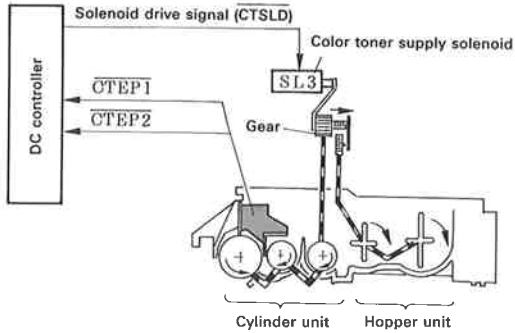

Figure 3-42

The sequence of operations is as follows:

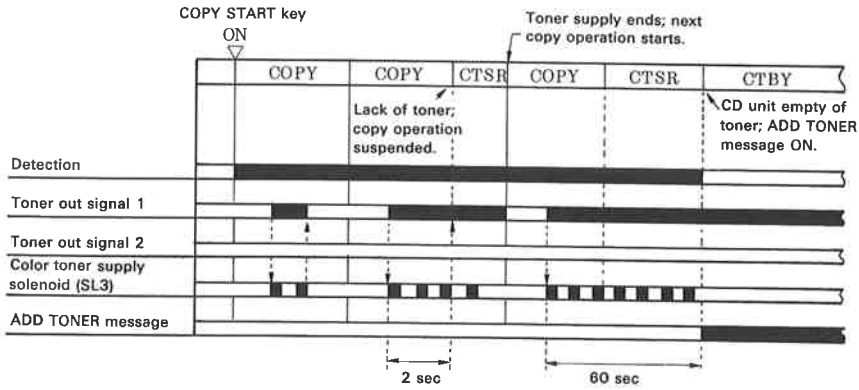

Figure 3-43

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If a large amount of toner has been consumed over a short period of time (solid red, etc.), the operations will be as follows:

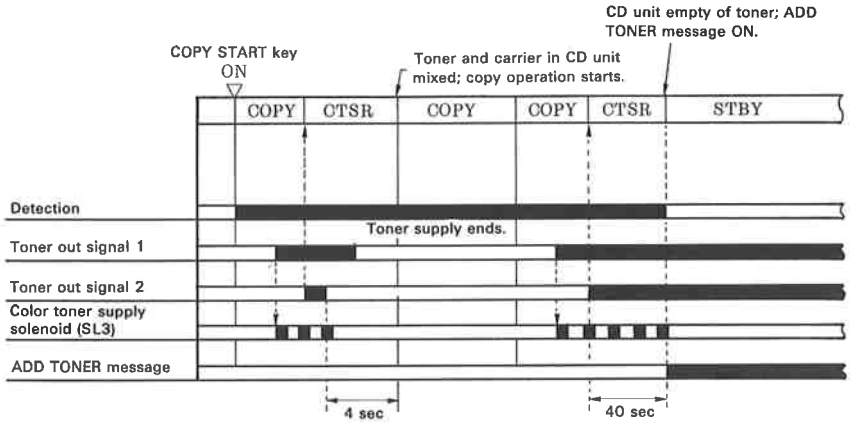

Figure 3-44

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4. Waste Toner Detection

When the main motor rotates, its drive is transmitted, in the order named, to the drum gear, cleaning roller gear, screw gear, coupling, and feedscrew. The feedscrew is used to carry the waste toner collected by the cleaning blade and cleaning roller into the drum.

The coupling is pressed against the screw gear by a spring for transmission of drive.

When the inside of the drum and the pipe becomes full of toner, the rotation of the feedscrew starts to drag, and the coupling is pushed up; this in turn cuts off the drive to the feedscrew and causes the lever to press on the microswitch.

At this time, the message 'WASTE TONER FULL' is indicated on the display.

Note:
Copies may still be made after this message appears; toner, however, will start to drop into the feeder unit after about 100 copies. It is, therefore, important to replace the drum as soon as possible.

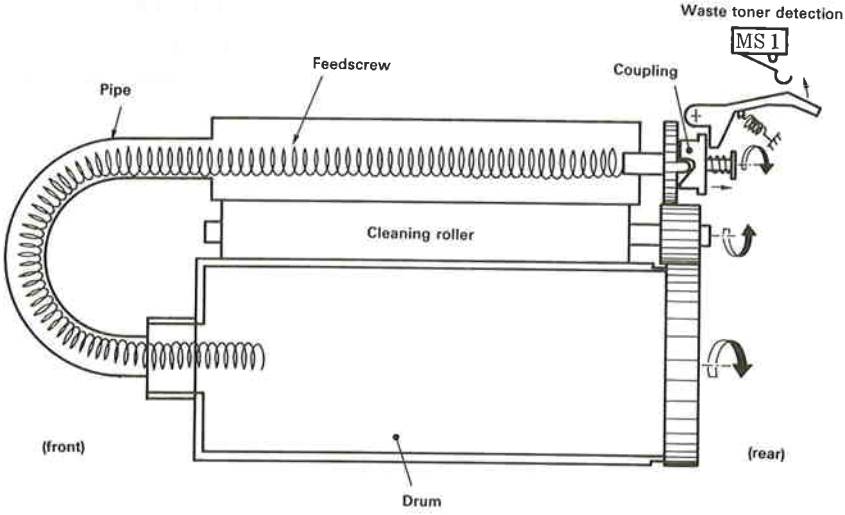

Figure 3-45

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IV. PICK-UP/FEEDER SYSTEM

A. Outline

Figure 3-46 is a diagram of the pick-up/feeder system. The set-back roller and delivery roller 2 are driven by an exclusive two-way stepping motor. The registration roller is controlled so that the entire roller rotates across the drum by a stepping motor (PM4), thereby keeping the side (cross way) of each sheet of copy paper and that of the respective image on the drum aligned.

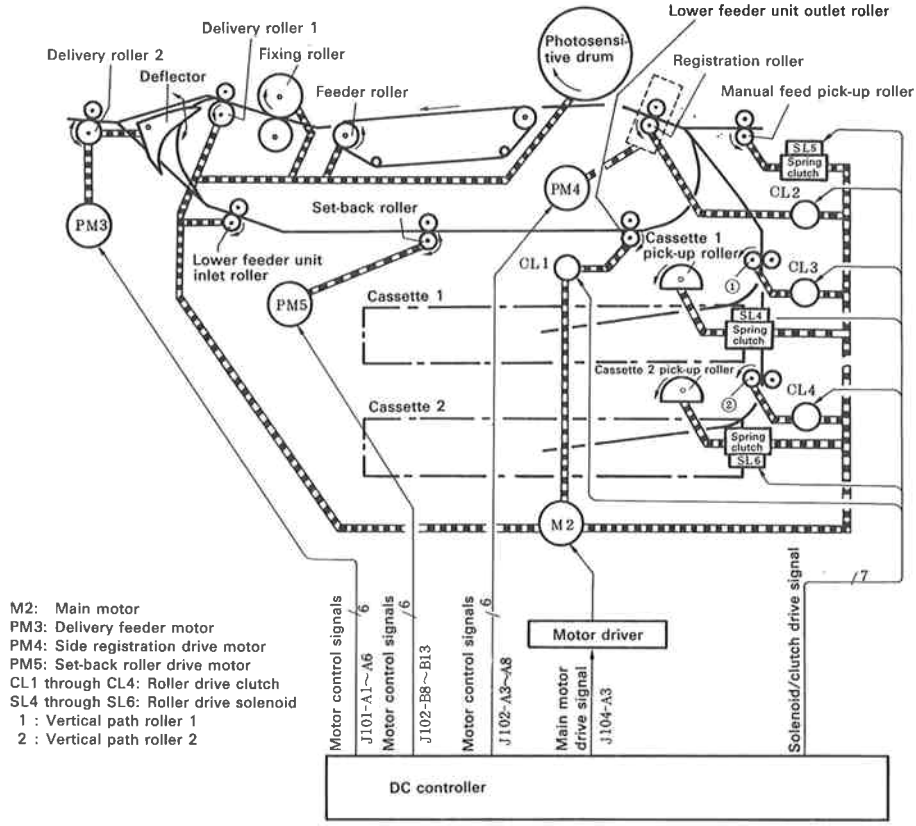

Figure 3-46

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The path through which copy paper travels is equipped with five photointerrupters which monitors the arrival or passage of copy paper.

The presence or absence of copy paper inside the cassettes is detected by photointerrupters PS9 and PS10.

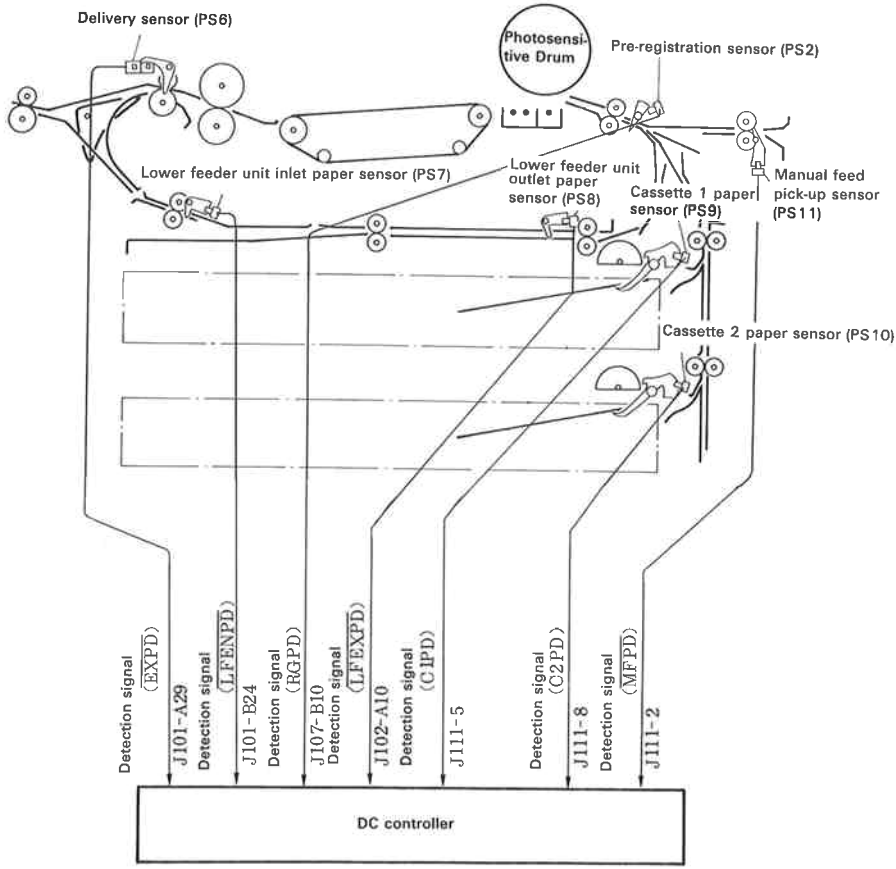

Figure 3-47

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B. Detection of Cassette Size

The cassette, when set in the cassette holder, actuates certain switches.

The microprocessor learns the size of the cassette and the presence or absence of a cassette through combinations of switches (CST1 through CST4) actuated as shown in Table 3-5. At the same time, the microprocessor makes decisions as to the counter, point of scanner reversal, and method of blank exposure control.

	Arrangement / Cassette size	SW 701 (left)	SW 702	SW 703	SW 704 (right)
	Cassette absent	0	0	0	0
	B5 (182 × 257)	0	0	0	1
*	U-L2 (203 – 220 × 317 – 354)	0	0	1	0
	A4 (210 × 297)	0	0	1	1
	B5R (257 × 182)	0	1	0	0
	B4 (364 × 257)	0	1	0	1
	A4R (297 × 210)	0	1	1	0
	A3 (420 × 297)	0	1	1	1
*	U-S1 (190 – 279 × 190 – 279)	1	0	0	0
*	U-S2 (190 – 279 × 190 – 279)	1	0	0	1
*	U-L1 (203 – 220 × 317 – 354)	1	0	1	0
	Letter 8.5″ × 11″ (216 × 279)	1	0	1	1
	Mini 5.5″ × 8.5″ (216 × 140)	1	1	0	0
	Legal 8.5″ × 14″ (356 × 216)	1	1	0	1
	Letter R 8.5″ × 11″ (279 × 216)	1	1	1	0
	Ledger 11″ × 17″ (432 × 279)	1	1	1	1

0 .... Indicates SW is OFF.
1 .... Indicates SW is ON.
* Sizes may be registered within the dimensions shown; for details, see page 3-115.

(unit: mm)

Table 3-5

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C. Pick-Up from Cassette

1. Outline

For pick-ups from the cassette, rollers are rotated by the drive transmitted from the main motor by way of clutches and solenoids.

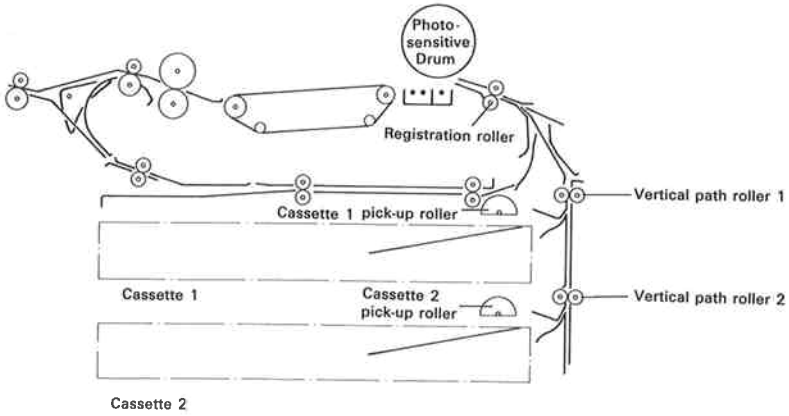

Figure 3-48

2. Pick-Up from Cassette 1

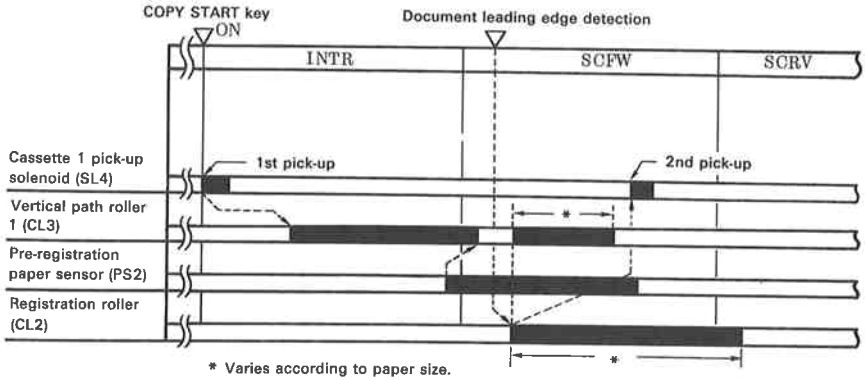

Figure 3-49

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3. Pick-Up from Cassette 2

a) Paper Size 217 mm or More

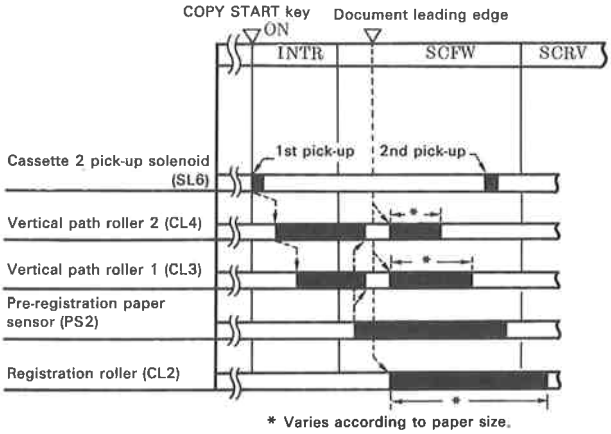

Figure 3-50

b) Paper Size 216 mm or Less

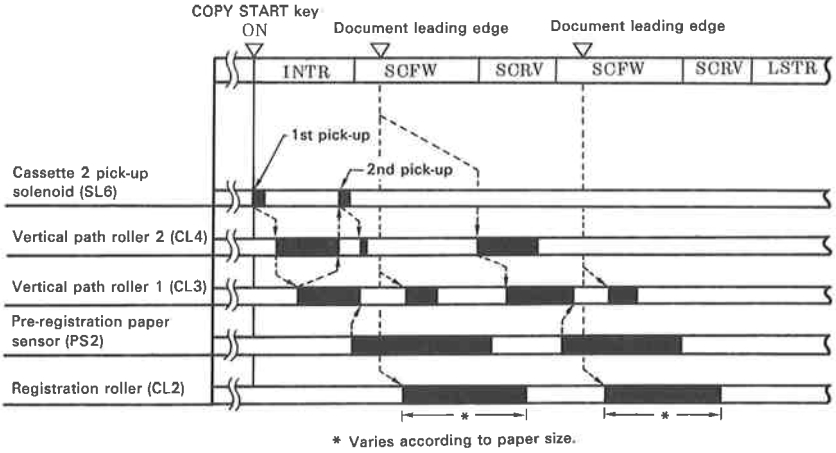

Figure 3-51

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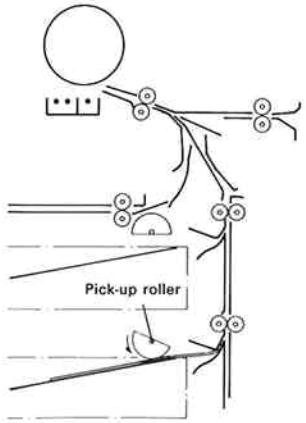
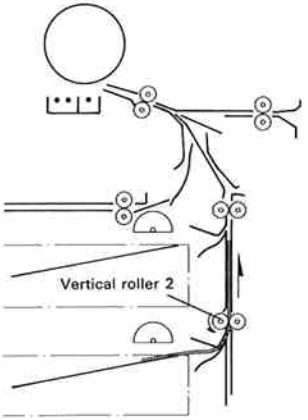
If the paper size is 216 mm or less, the operation will be as follows:

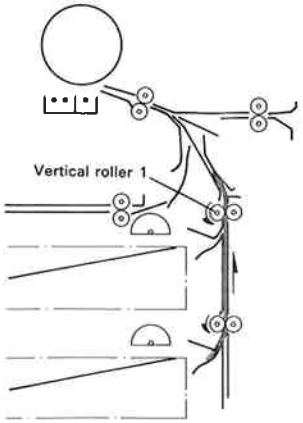
Cassette 2 pick-up clutch goes ON, and pick-up roller rotates once.



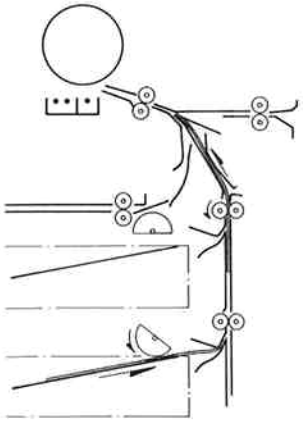
Paper is butted against vertical path 2, forms an arc, and turns feeder clutch 2 ON; vertical roller 2 rotates.



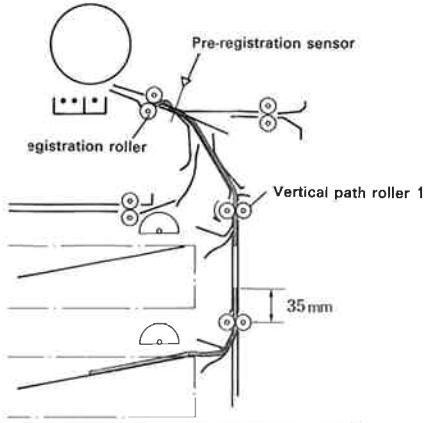
0.5 sec thereafter, feeder clutch 1 goes ON, and vertical roller 1 rotates.



About 1 sec after vertical roller 1 rotates, vertical roller 2 stops; cassette 2 pick-up clutch goes ON, and 2nd paper is picked up.



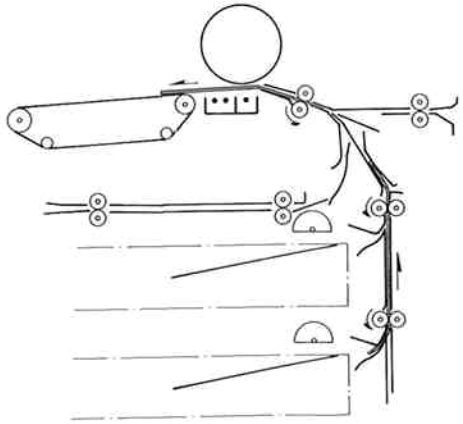
- 0.5 sec after 2nd pick-up, vertical path roller 2 rotates for 0.2 sec. and paper stops at points shown below.
- 1st paper moves to pre-registration sensor; vertical path roller rotates for 0.2 sec, and paper forms an arc.



Scanner moves forward and reaches leading edge of image. 0.3 sec* thereafter, registration clutch and feeder clutch 1 go ON to send 1st paper to feeder unit.

* Variable in service mode.

Vertical path roller 2 rotates; 0.5 sec thereafter, vertical path roller 1 rotates to send 2nd paper.



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D. Pick-Up from Manual Tray

1. Pick-Up from Manual Tray

The manual feed pick-up roller is driven by the main motor and rotates when the manual feed pick-up solenoid (SL5) is ON. The manual feed pick-up roller starts to rotate as soon as the manual feed pick-up sensor (PS11) detects copy paper.

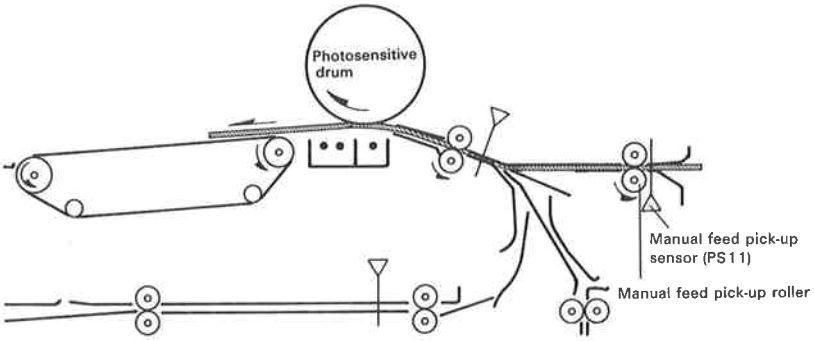

Figure 3-52

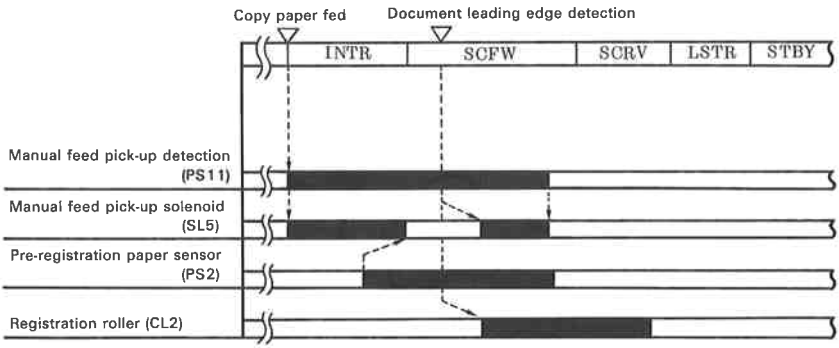

Figure 3-53

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E. Registration Roller

1. Outline

The copy paper is butted against the registration roller to form an arc, corrected if skewed, and adjusted for pick-up timing.

The copying machine is capable of moving the registration roller sideways so as to align the image end (cross way) on the drum and that of the copy paper.

The drive of the side registration motor (PM4) is transmitted to gear C by way of gears A and B; gear C and gear B are of a single entity. The rotation of gear C moves the registration roller sideways; see Figure 3-54 (cross section at A).

The end of copy paper is detected by the side registration paper end sensor (PS 1).

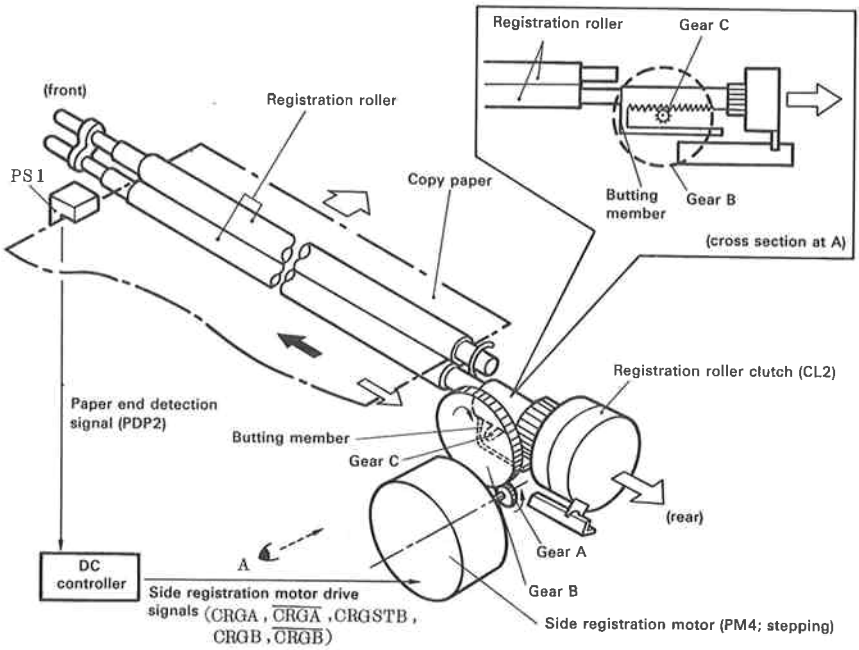

Figure 3-54

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2. Registration

The sequential operation of the registration roller is as follows:

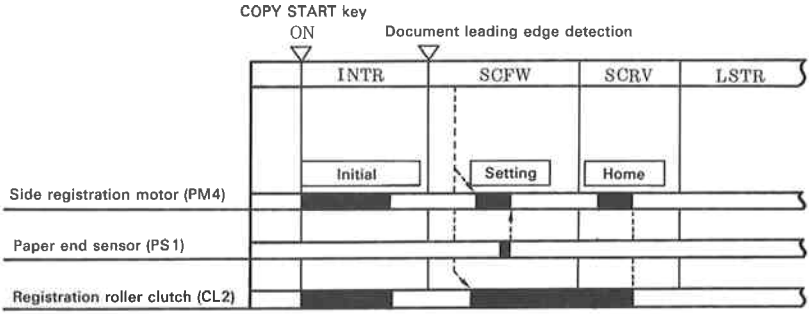
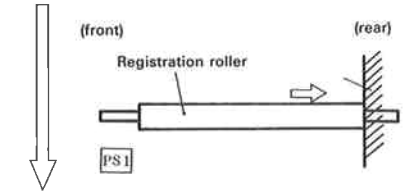


Figure 3-55

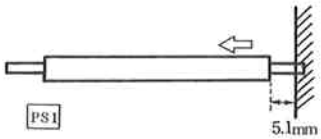
<Initial>

Registration roller is moved to rear and butted against butting member.



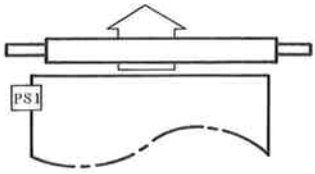
Registration roller is moved 5.1 mm to front from butting member.

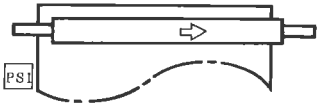
■ Home position



<Setting>

- If the sensor detects paper, the registration roller is moved to the rear; the point at which the paper leaves the sensor will be the setting position.





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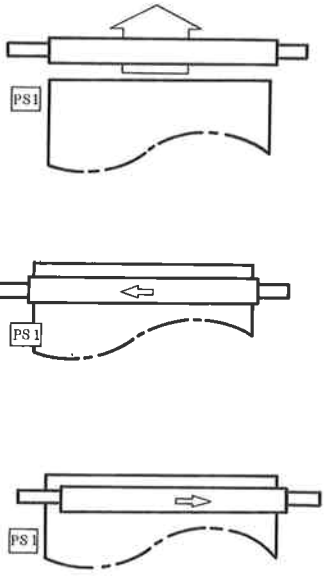
- If the sensor does not detect paper, the registration roller is moved to the front; it is moved to the rear when the sensor detects paper. The point at which the paper leaves the sensor is the setting position.



The registration roller is returned to the home position.

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F. Overlay Copying (single sheet) (NP-3825 only)

1. Outline

The copy paper moves as shown in Figures 3-56 and -57. For copying on the first side, delivery roller 2 rotates in reverse to shift up the deflector. The copy paper then stops at a point several millimeters from the lower feeder unit outlet roller in preparation for the second side.

Copying on 1st side

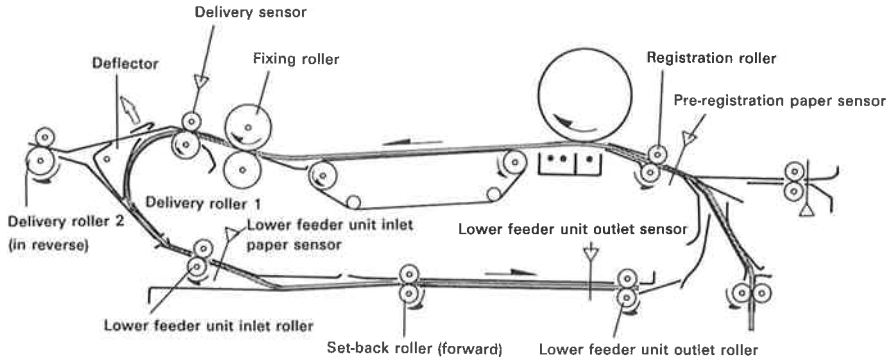

Figure 3-56

Copying on 2nd side

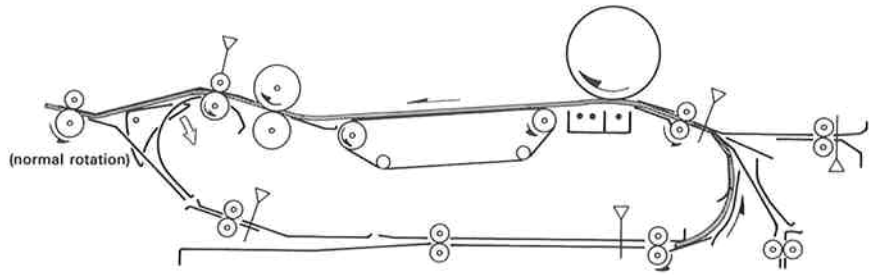

Figure 3-57

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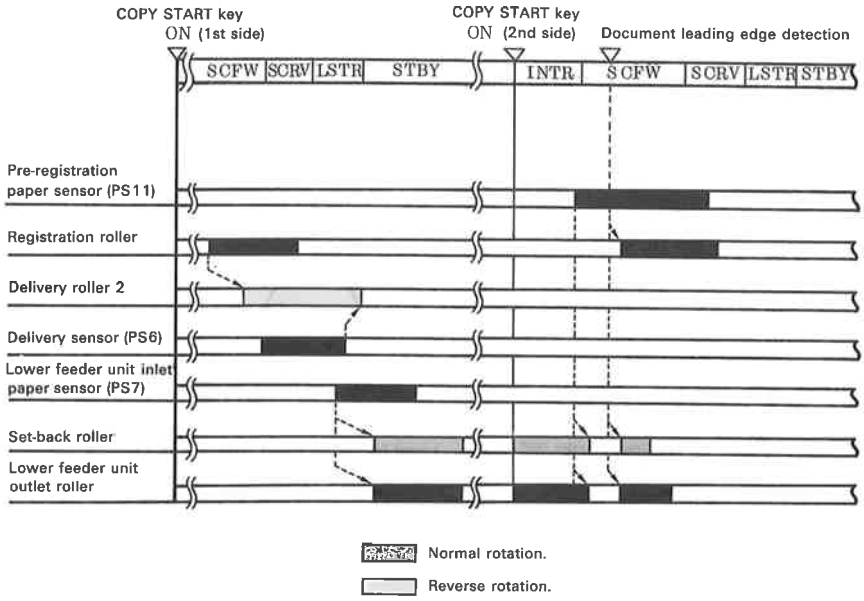

Figure 3-58

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G. Two-Sided Copying (single copy; NP-3825 only)

1. Outline

Figures 3-59 and -60 show how copy paper moves inside the NP-3825.

For copying on the first side, delivery roller 2 reverses its rotation 0.3 second after the trailing edge of the copy paper passes by the delivery sensor, and the deflector is shifted up. This causes the copy paper to switch back and move to the lower feeder unit.

The copy paper then stops several millimeters past the lower feeder unit outlet roller to wait for copying on the second side.

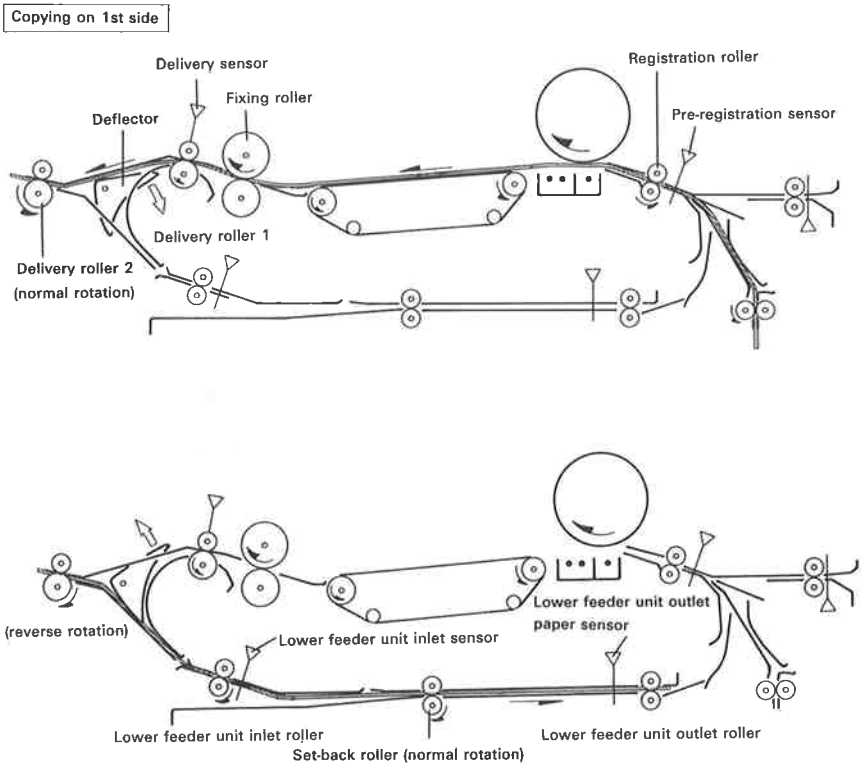

Figure 3-59

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Copying on 2nd side

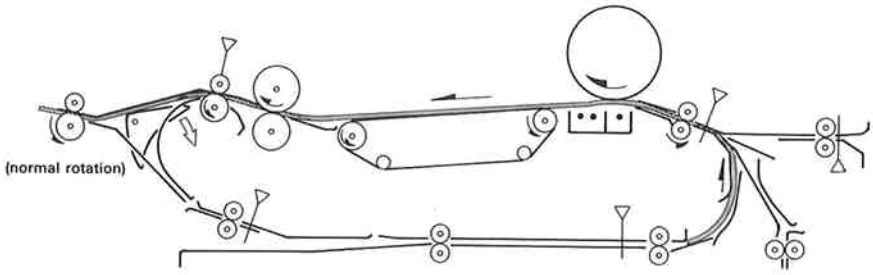

Figure 3-60

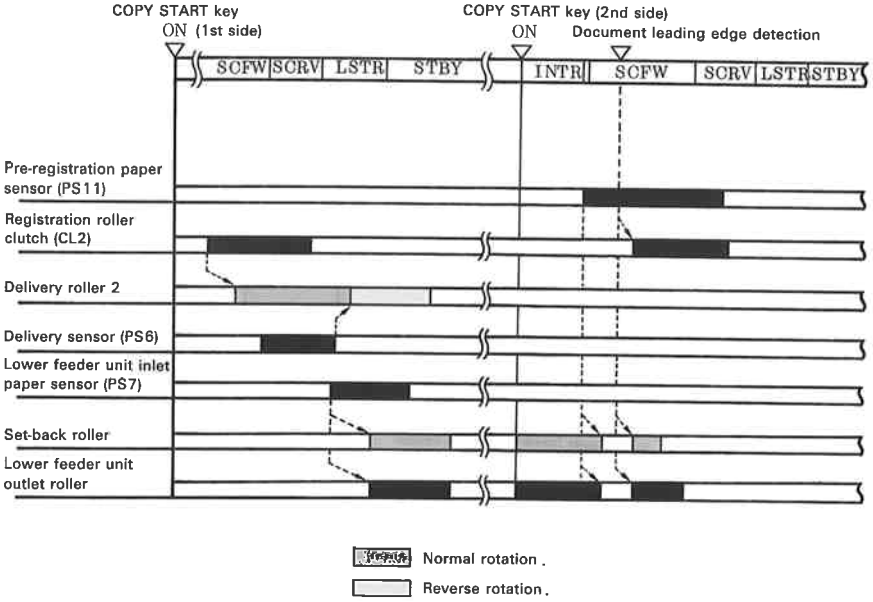

Figure 3-61

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H. Lower Feeder Unit (NP-3825 only)

1. Outline

The NP-3825 is equipped with a set-back mechanism for the two-sided and overlay continuous copy operation.

The set-back mechanism serves to stack up sheets of copy paper in the lower feeder unit so as to prevent double feeding within a limited space.

The set-back mechanism calls for the following conditions:

1. Copy paper size: A4, B5, LTR
2. No. of sheets: 2 to 10

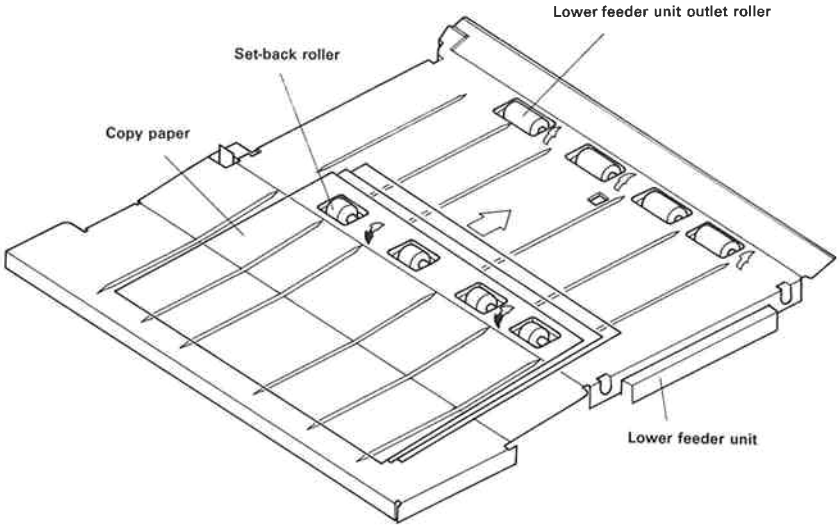

Figure 3-62

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2. Set-Back Operations (1st side)

As shown in Figure 3-63, the lower feeder unit inlet roller and outlet roller are driven by the main motor, and the set-back roller is driven by a stepping motor (PM5) used exclusively for the roller.

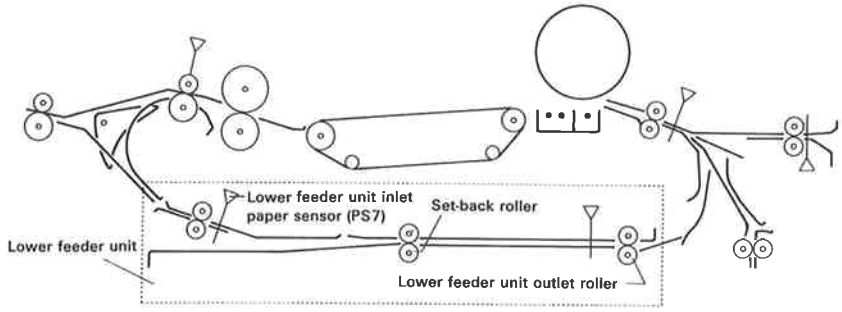

Figure 3-63

The sequence of operations is as follows:

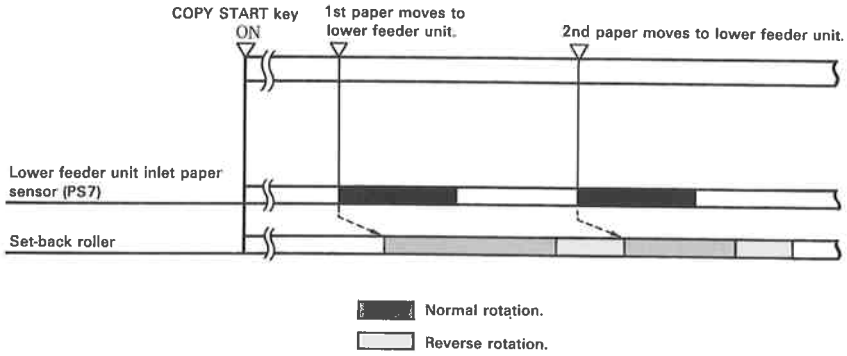
COPY START key ON
1st paper moves to lower feeder unit.
2nd paper moves to lower feeder unit.
Lower feeder unit inlet paper sensor (PS7)
Set-back roller
Normal rotation.
Reverse rotation.

Figure 3-64

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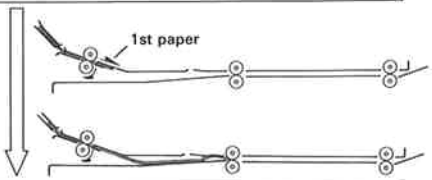
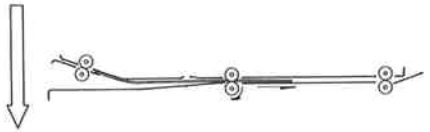
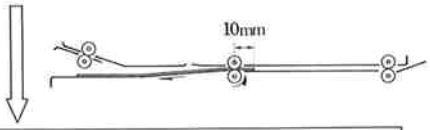
Paper moves to lower feeder unit. (PS7)



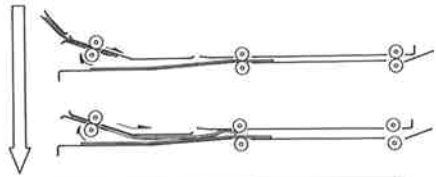
Paper forms an arc; thereafter, set-back roller rotates to move paper from the lower feeder unit inlet paper sensor.



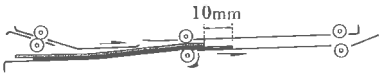
Set-back roller reverses to stop paper at position shown.

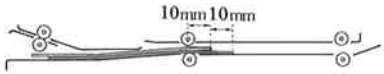


2nd paper moves to lower feeder unit.



2nd paper moves as 1st paper.





The above operation is repeated until up to 10 sheets of paper are stacked in the lower feeder unit.

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3. Re-Pick-Up

After copying on the first side, the NP-3825 picks up the next paper from those stacked in the lower feeder unit.

The sequence of operations is as follows:

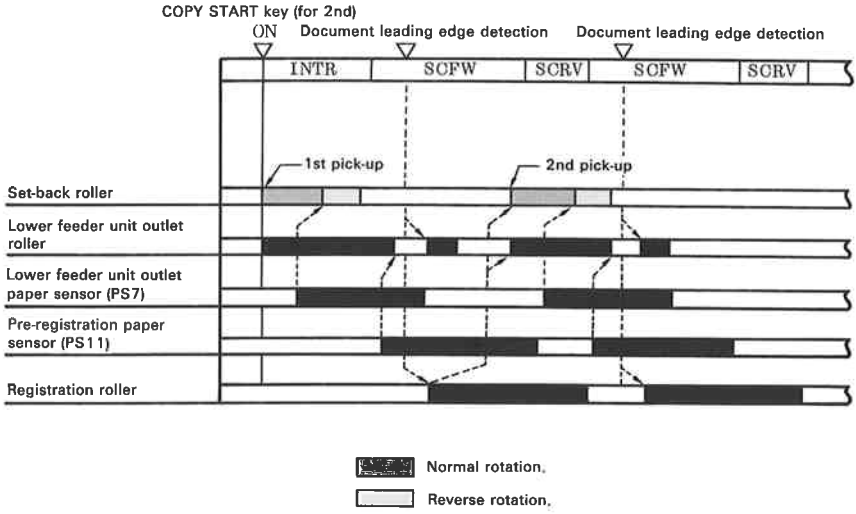

Figure 3-65

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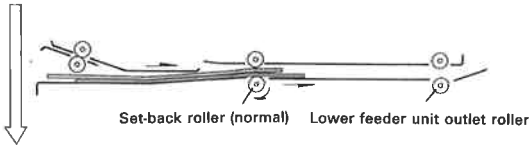
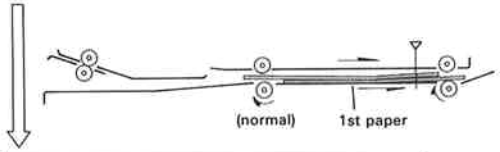
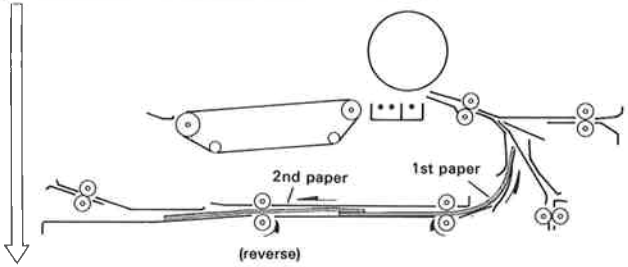
COPY START key ON for 2nd side; thereafter, set-back roller and lower feeder unit outlet roller rotate.



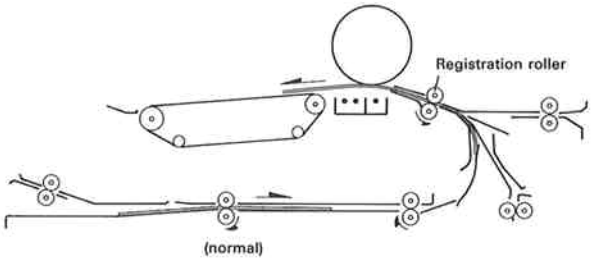
1st paper moved by lower feeder unit outlet roller.



Paper moves to PS8; several sec thereafter, set-back roller reverses to return 2nd paper.



Registration roller goes ON; several sec thereafter, 2nd pick-up starts.



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I. Fixing System

1. Fixing Roller Temperature Control

The upper and lower rollers of the fixing assembly and delivery roller 1 are driven by the main motor (M2).

The upper roller is heated by a single fixing heater (H1; 850 W), and its surface temperature is monitored by a thermistor (TH1).

Fixing assembly surface temperature is high.

Thermistor (TH1) resistance is low.

└ Fixing assembly roller surface temperature detection signal (FRST) voltage is low.

The microprocessor on the DC controller controls the fixing heater drive signal ($\overline{HTRD}$) in terms of '1' and '0' based on the voltage of FRST to make sure that the surface temperature of the upper roller is of a specified value.

Copy/STBY ..... at 180°C

Warm-up ..... at 180°C

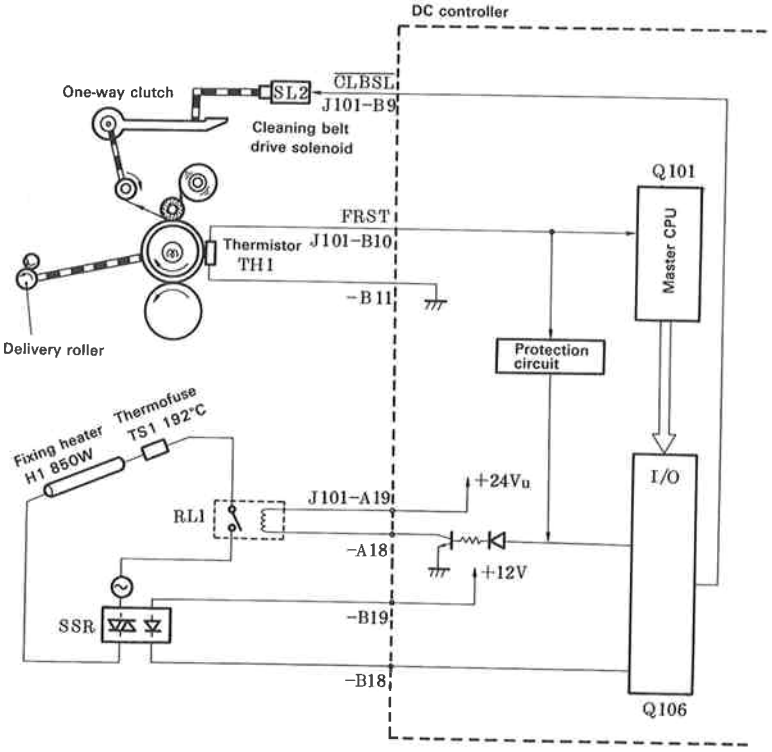

Figure 3-66

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2. Detection of Problem

The copying machine is equipped with three types of protection mechanism which prevent malfunction of the fixing heater.

① The master CPU (Q101) monitors the voltage of TH1 and, if necessary, causes E000, E001, E002, and E003 to go ON; at the same time, the output from the I/O port IC (Q106) causes ACCUT = '0', and the relay (RL1) goes OFF.

② If the voltage of TH1 drops below 1.4 V (equivalent of 192°C), regardless of the output from the microprocessor, the fixing heater protection circuit is activated; this causes ACCUT = '0', and the relay (RL1) goes OFF.

③ If the temperature inside the thermoswitch exceeds 192°C, the thermoswitch goes OFF to cut the power to the fixing heater OFF.

3. Cleaning Belt

The cleaning belt, which is used to clean the upper roller is driven by the ON/OFF operations of the belt drive solenoid (SL2) activated in response to the state (1, 0) of the belt drive signal ($\overline{\text{CLBSD}}$). A single activation of the belt drive solenoid takes up the belt by about 0.12 mm.

The DC controller keeps count of the operations of the cleaning drive solenoid and indicates 'BELT OUT' on the message display upon completion of the 100,000th operation.

Note:
The condition leads to damage on the fixing roller; replace the belt as soon as possible when the message appears.

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4. Operations Sequence for Fixing Assembly

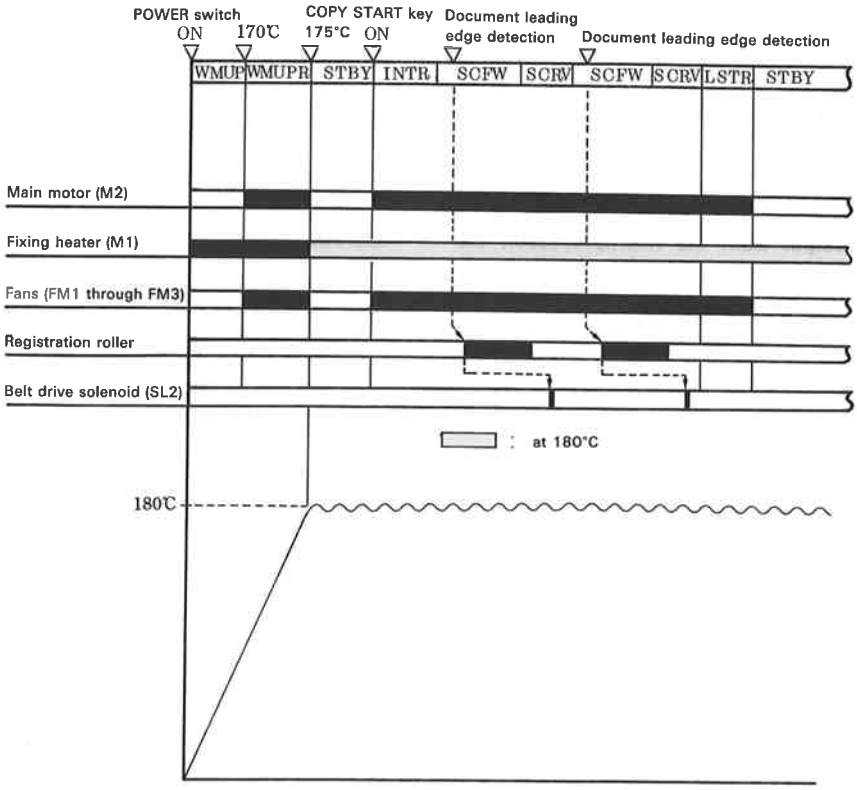

Figure 3-67

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J. Delivery Unit

1. Outline

Figure 3-68 shows the construction of the delivery unit. The deflector, according to the direction of rotation of delivery roller 2, operates as shown. Delivery roller 2 is driven by a stepping motor (PM3) used exclusively for the roller.

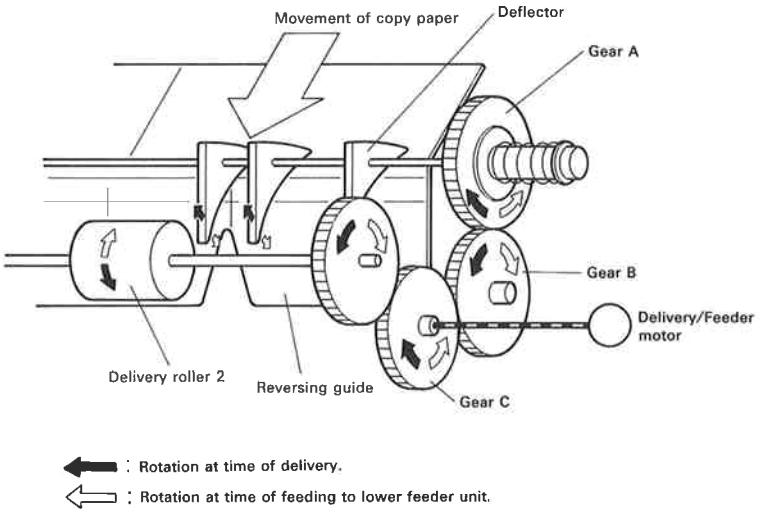

Figure 3-68

2. Delivery

The copy paper is delivered according to the following sequence.

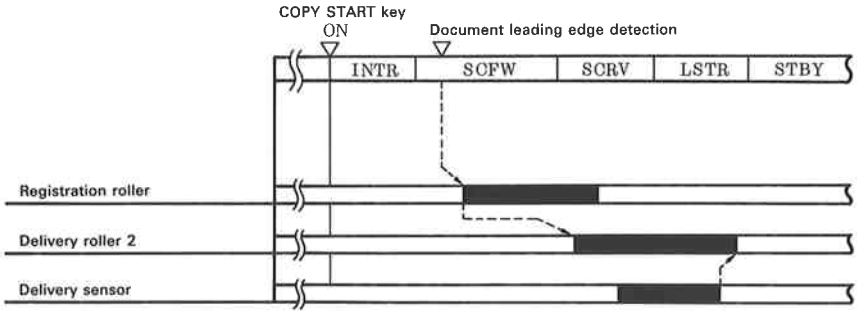

Figure 3-69

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K. Detection of Jams

The copying machine is equipped with copy paper sensors so as to check the presence or absence of copy paper and whether it is fed normally; see Figure 3-70.

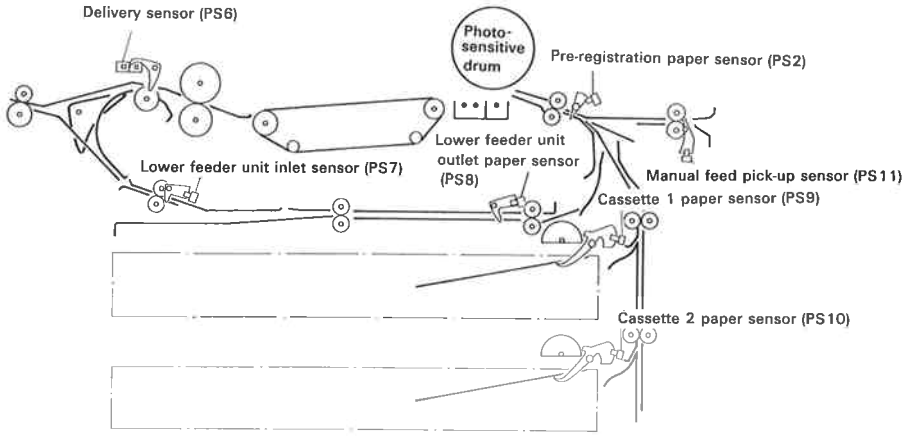
Delivery sensor (PS6)
Photo-sensitive drum
Pre-registration paper sensor (PS2)
Lower feeder unit outlet paper sensor (PS8)
Lower feeder unit inlet sensor (PS7)
Manual feed pick-up sensor (PS11)
Cassette 1 paper sensor (PS9)
Cassette 2 paper sensor (PS10)

Figure 3-70

The copying machine checks the presence or absence of paper or jams in terms of the presence or absence of paper over sensors according to the timing programmed in advance in the microprocessor.

The copying machine is capable of keeping the number of copies and copy modes at time of a jam in its memory; therefore, it is not necessary to set the remaining number of copies or copy modes after opening and closing the copying machine for jam removal.

The microprocessor identifies the following conditions as jams; in addition, opening of the upper right door, lower door, delivery door, and manual feed tray cover is likewise treated as jams.

When a jam occurs, the main motor and relay (RL1) go OFF to stop the AC loads.

1. Paper and Power-On

The sequence of operations when paper is present inside the machine upon power-on is as follows:

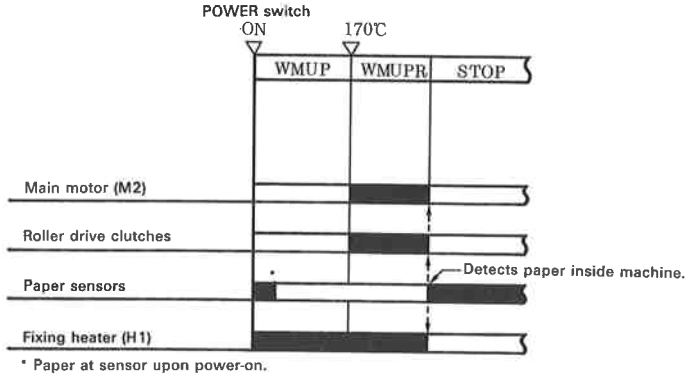

Figure 3-71

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2. Delay Jam by Pre-Registration Paper Sensor

a. Manual Feed Pick-Up
The paper fails to reach the pre-registration paper sensor (PS2) within a specified period of time after the manual feed pick-up roller goes ON.

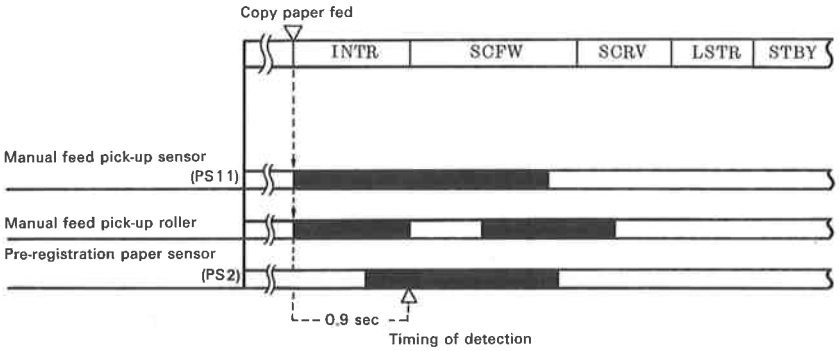

Figure 3-72

b. Pick-Up from Cassette 1
The copy paper fails to reach the pre-registration paper sensor (PS2) within a specified period of time after vertical path roller 1 goes ON.

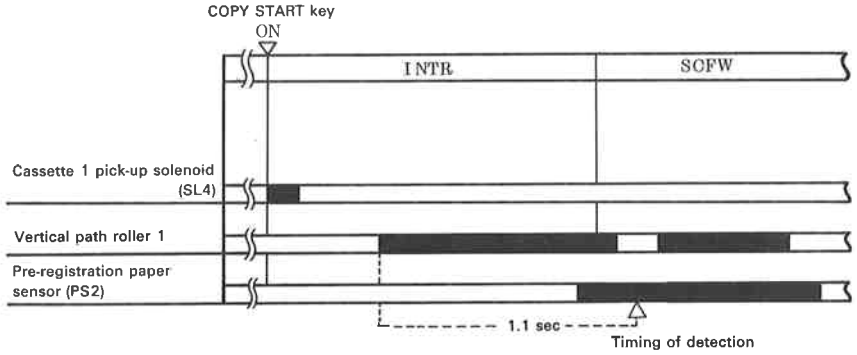

Figure 3-73

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c. Pick-Up from Cassette 2
The copy paper fails to reach the pre-registration paper sensor (PS2) within a specified period of time after vertical path roller 2 goes ON.

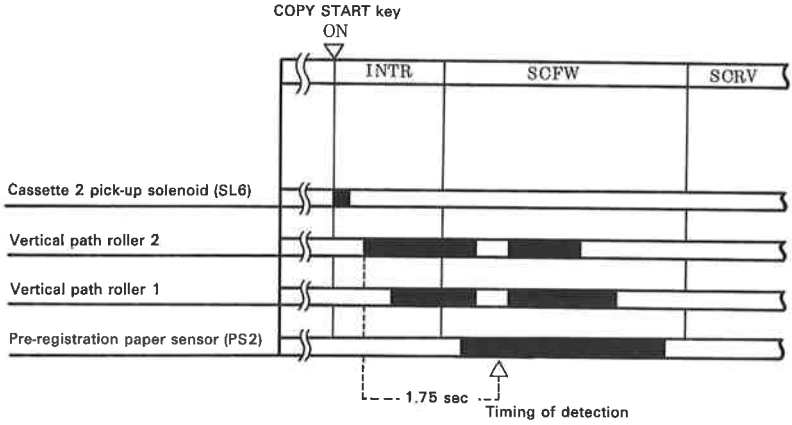

Figure 3-74

d. Re-Pick-Up from Lower Feeder Unit
The copy paper fails to reach the pre-registration paper sensor (PS2) within a specified period of time after the lower feeder unit outlet roller goes ON.

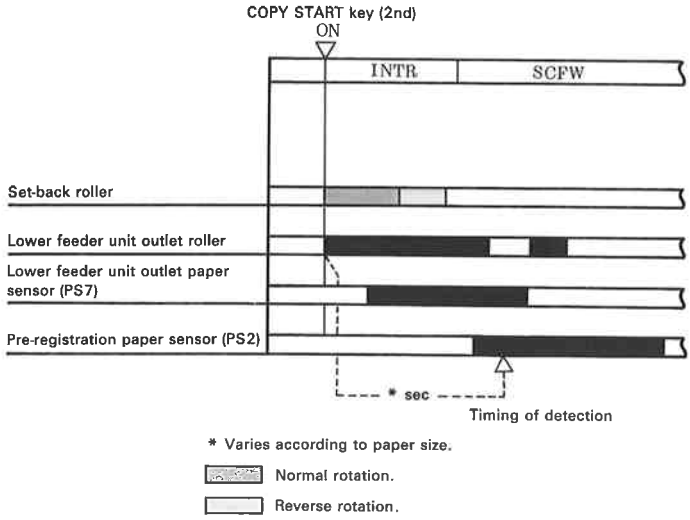

Figure 3-75

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3. Delay Jam by Delivery Sensor

The copy paper fails to reach the delivery sensor (PS6) within a specified period of time after the registration roller goes ON.

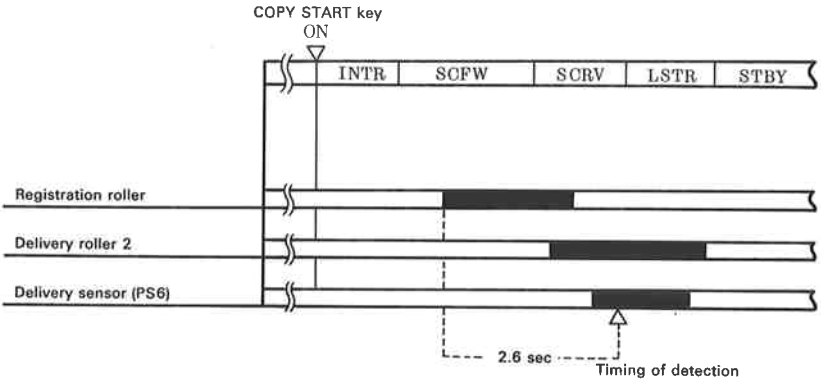

Figure 3-76

4. Stationary Jam by Delivery Sensor

The copy paper fails to pass by the delivery sensor (PS6) within a specified period of time after the delivery sensor has detected it.

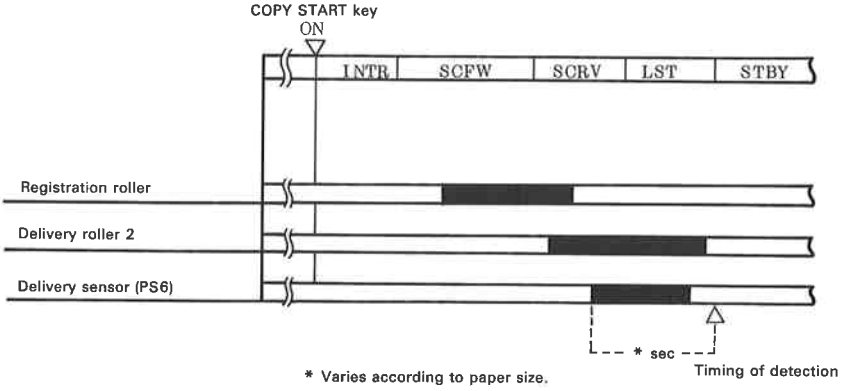

Figure 3-77

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5. Delay Jam by Lower Feeder Unit Inlet Paper Sensor

a. Two-Sided
The copy paper fails to reach the lower feeder unit inlet paper sensor (PS7) within a specified period of time after the delivery motor has started to rotate in reverse.

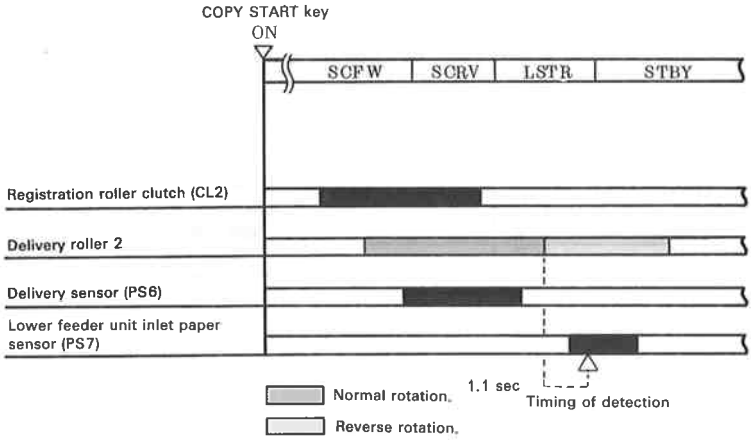

Figure 3-78

b. Overlay
The copy paper fails to reach the lower feeder unit inlet paper sensor (PS7) within a specified period of time after the delivery sensor (PS6) has detected the leading edge of the paper.

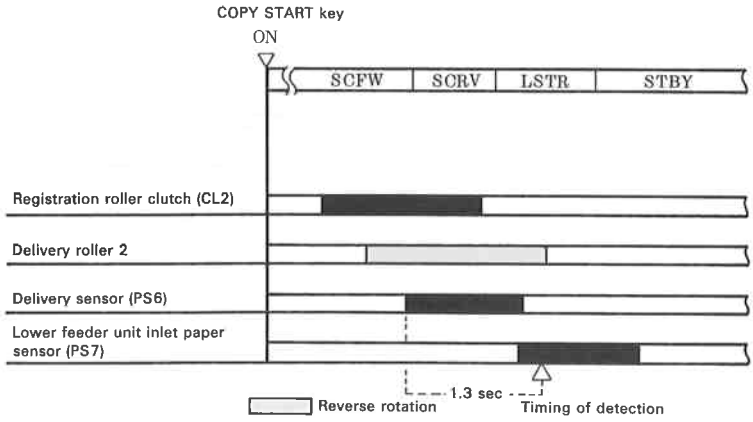

Figure 3-79

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6. Stationary Jam by Lower Feeder Unit Inlet Paper Sensor

The copy paper fails to pass by the lower feeder unit inlet paper sensor (PS7) within a specified period of time after the lower feeder unit inlet paper sensor (PS7) has detected the leading edge of the paper.

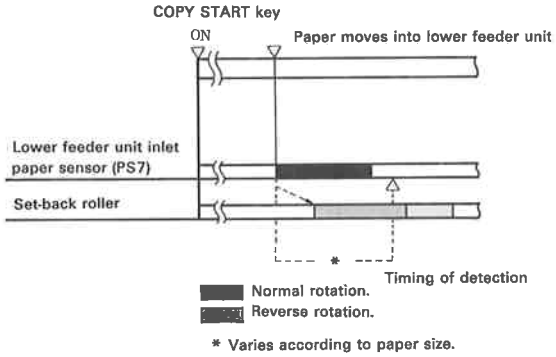

Figure 3-80

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V. POWER SUPPLY

A. Outline of Power Supply

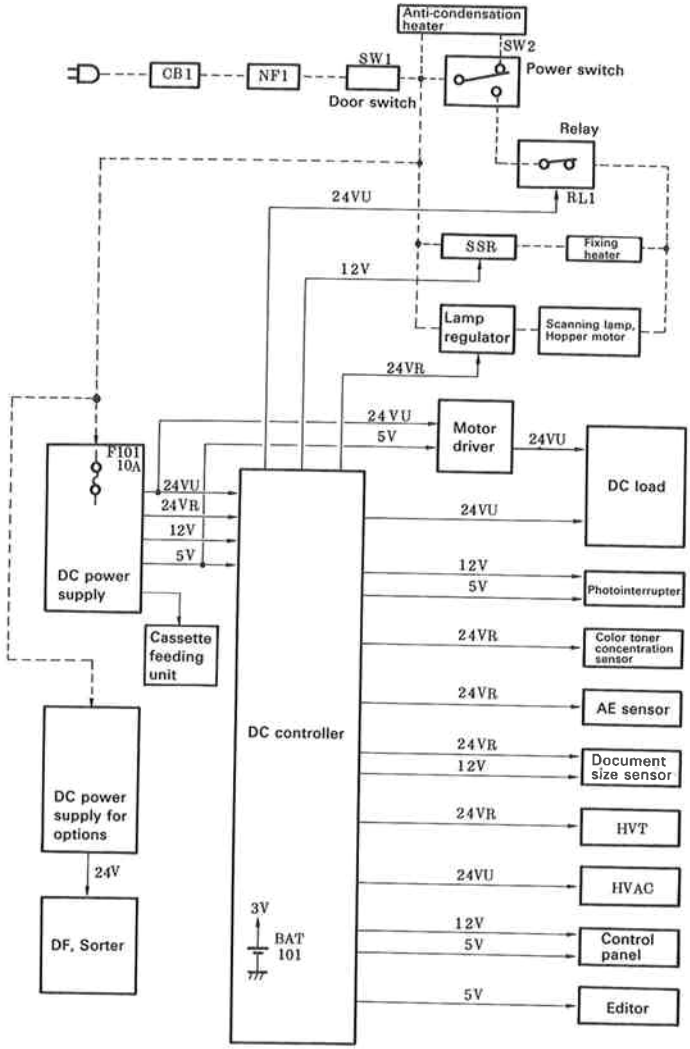

Figure 3-81

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The DC power supply is fed with AC power as soon as the door switch and power switch are turned ON.

The DC power supply produces outputs of 24 VR, 24 VU, 12 V, and 5V.

When the auto shut-off mechanism is activated, the DC controller causes the fixing roller heater to go OFF.

When the door switch and power switch are turned OFF, the DC controller is deprived of DC power supply; for this reason, the copying machine is equipped with a lithium battery for back-up (BAT101) for SRAM (Q105) of the DC controller.

The DC power supply for options provides the document feeder and sorter with 24 V power.

B. Protection Mechanism for Power Supply Circuit

The DC power supply has an over-current detecting circuit; should a short-circuit occur in the loads for some reason, the protection mechanism is activated to stop the power output.

To return the output, turn the door switch OFF by opening the front door and, thereafter, correct the loads, and turn the door switch ON.

Note:
Repeated short-circuiting and resetting thereafter can blow the fuse built inside.

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VI. EDITOR (NP-3825 only)

A. Outline

1. Electric Circuitry

The electrical control of the editor is performed by the editor controller PCB. The editor controller PCB is a microprocessor which, according to the programs stored in advance, reads the paints pressed by the cordless pen by means of a plane-shaped resistor and sends signals to the copying machine as necessary.

2. Communication with copying machine

The transmission of signals between the editor and copying machine is in serial as shown in Figure 3-82. The editor is supplied with power by the copying machine, and the 5V DC received is converted to 3.5V DC inside the editor controller PCB.

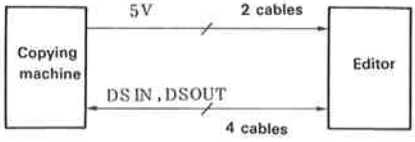

Figure 3-82

3. Inputs to and Outputs from Editor Controller PCB

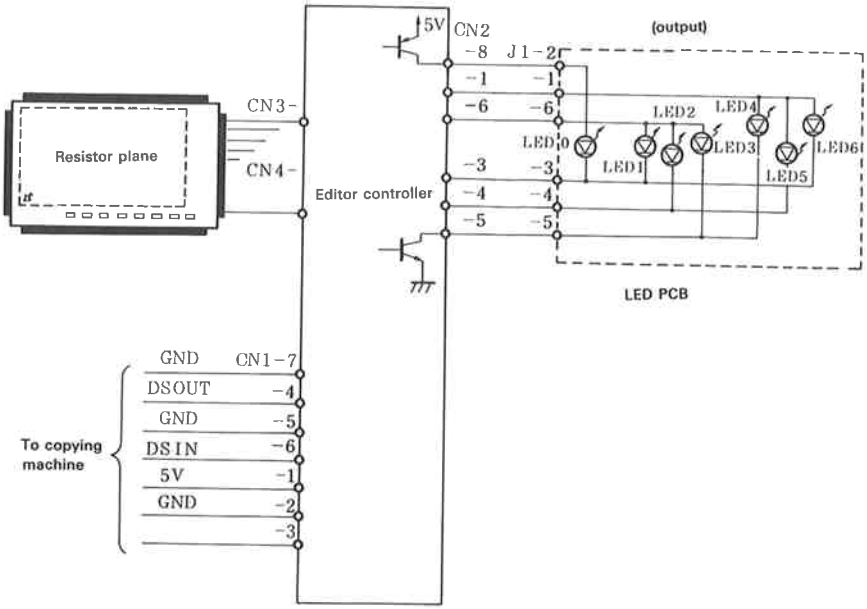

Figure 3-83

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4. Basic Construction of Editor

The editor consists of a tablet and cordless pen.

Figure 3-84 shows the basic construction of the tablet. The tablet is of a layered construction and is composed of, from top to bottom, a protection sheet, X plane-shaped resistor, Y plane-shaped resistor, and fixed plate.

The Y plane-shaped resistor is provided with bosses called dot spacers. The dot spacers are arranged over the Y plane-shaped resistor and serve to prevent contact between the X and Y plane-shaped resistors in the absence of pressure on the tablet.

A tablet is also placed under the editor control panel, i.e., STOP/CLEAR, MEMORY, four COLOR CONVERSION keys, as well as under the sheet on which a document is placed.

The editor controller serves to read the location specified by the cordless pen in terms of area designation or input from the keys mentioned above.

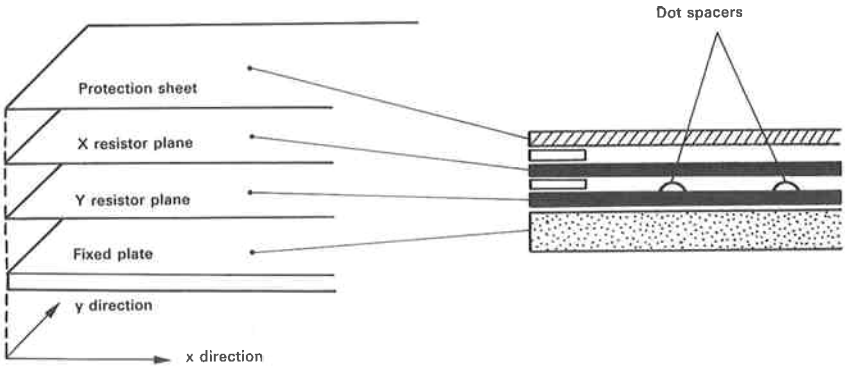

Figure 3-84A

Figure 3-84B

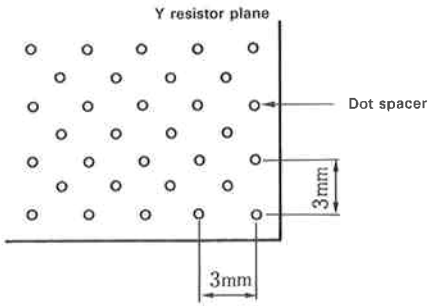

Figure 3-84C

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B. Construction of Electrical Circuitry

1. Reading Input Operations

The editor detects presses by the cordless pen as described below.

Figure 3-85 shows the equalization circuit of the comparator. (SW1 is ON; SW2, SW3, SW4 are OFF.)

The negative side of the comparator receives the voltage of Ra, Rb, Rc, and Rd. (Rc is contact resistance).

The reference value of the comparator, on the other hand, is determined in relation to R1 and R2, and received on the positive side.

When the tablet is pressed with pressure greater than a specified value and contact resistance Rc in turn decreases, the voltage on the negative side of the comparator increases.

This causes output V0 of the comparator to go from '1' to '0', and the microprocessor identifies the condition to be a press by the cordless pen.

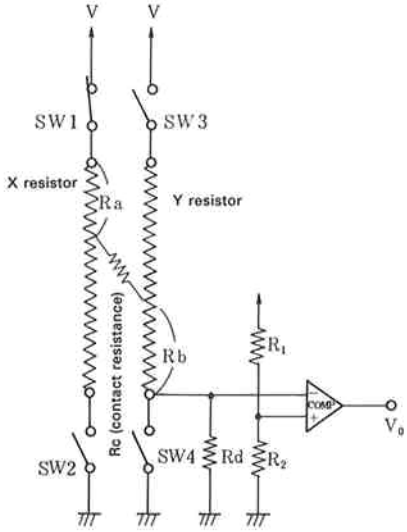

Figure 3-85 Equalization Circuit of Comparator

2. Reading X Coordinates

Figure 3-86 shows the equalization circuit of the tablet. (SW1 and SW2 are ON; SW3 and SW 4 are OFF.)

The SWs are shifted as shown in Figure 3-86, and the pressure divided between resistance Ra and Rb is lead to the A/D converter. The microprocessor reads the condition in terms of X coordinates.

The input impedance of the A/D converter is appreciably large and, as such, variation of Rc (contact resistance) will not affect the X coordinates.

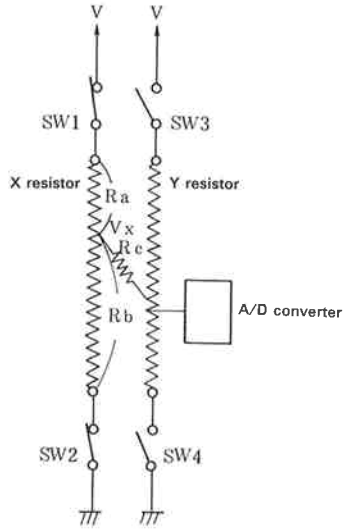

Figure 3-86 When Reading X Coordinates

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3. Reading Y Coordinates

The SWs are shifted as shown in Figure 3-87, and the Y coordinates are read in the same way as X coordinates. (SW1 and SW2 are OFF; SW3 and SW4 are ON.)

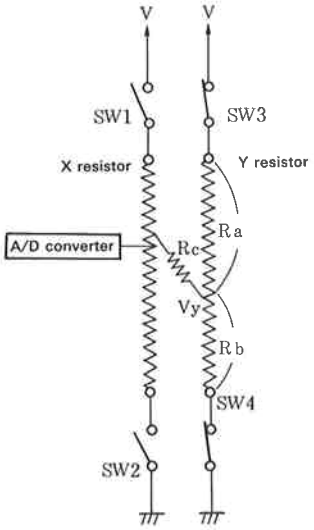

Figure 3-87 When Reading Y Coordinates

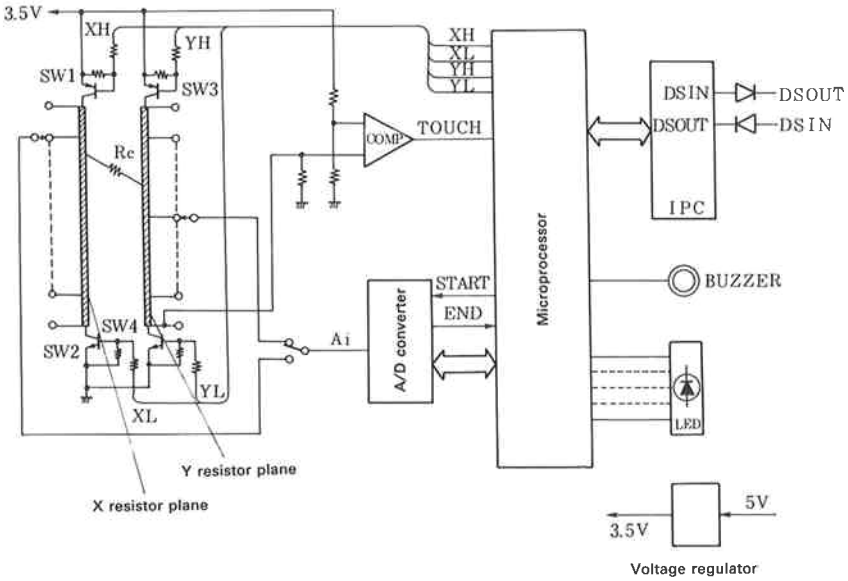

Figure 3-88 Block Diagram of Tablet and Editor Controller

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VII. PAPER DECK

A. Electric Circuitry

The paper deck is controlled by its own built-in controller and signals from the copying machine.

The copying machine sends signals to the controller as necessary according to the program stored in memory.

The controller inside the deck sends signals to drive motors, clutches, and other loads in response to the signals from the copying machine as well as from microswitches and sensors.

Figure 3-89 is a block diagram showing the relationship among the major circuits of the deck.

Each of the loads is supplied with the 24 VDC from the copying machine.

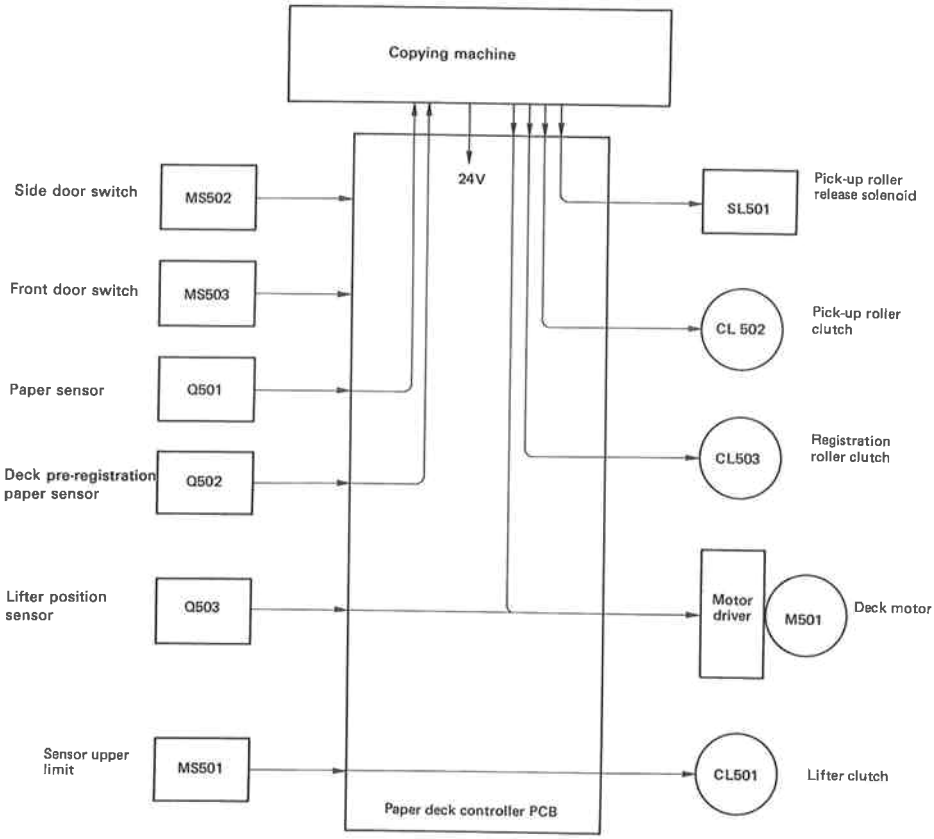

Figure 3-89

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B. Inputs to and Outputs from Paper Deck Controller (1/2)

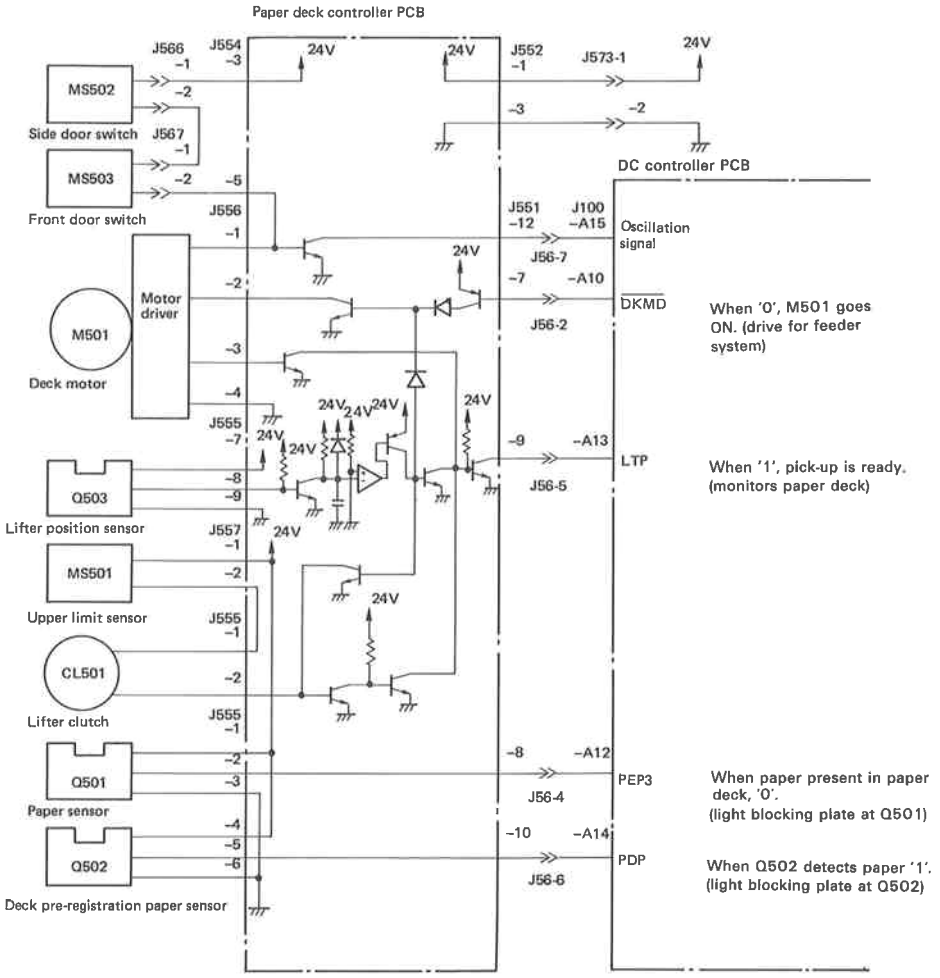

Figure 3-90

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Inputs to and Outputs from Paper Deck Controller (2/2)

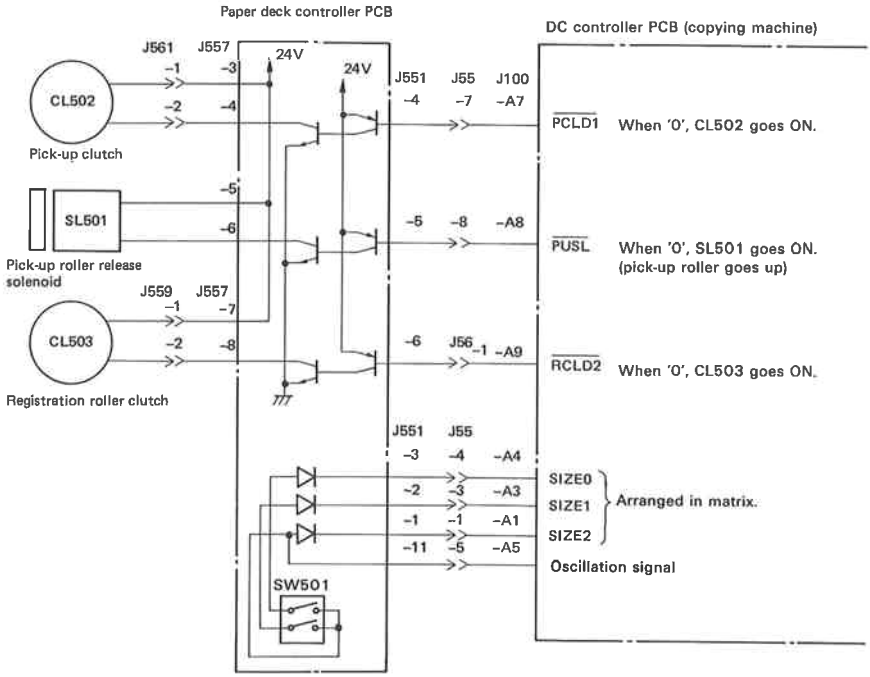

Figure 3-91

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C. Outline

The paper deck motor (M501) serves to raise the lifter and drive the pick-up, separation, and registration rollers.

The paper deck motor is controlled by the signals from the copying machine as well as from sensors and switches by way of the paper deck controller PCB.

The lifter lowers on its own weight when the paper deck is pulled out, releasing the gears.

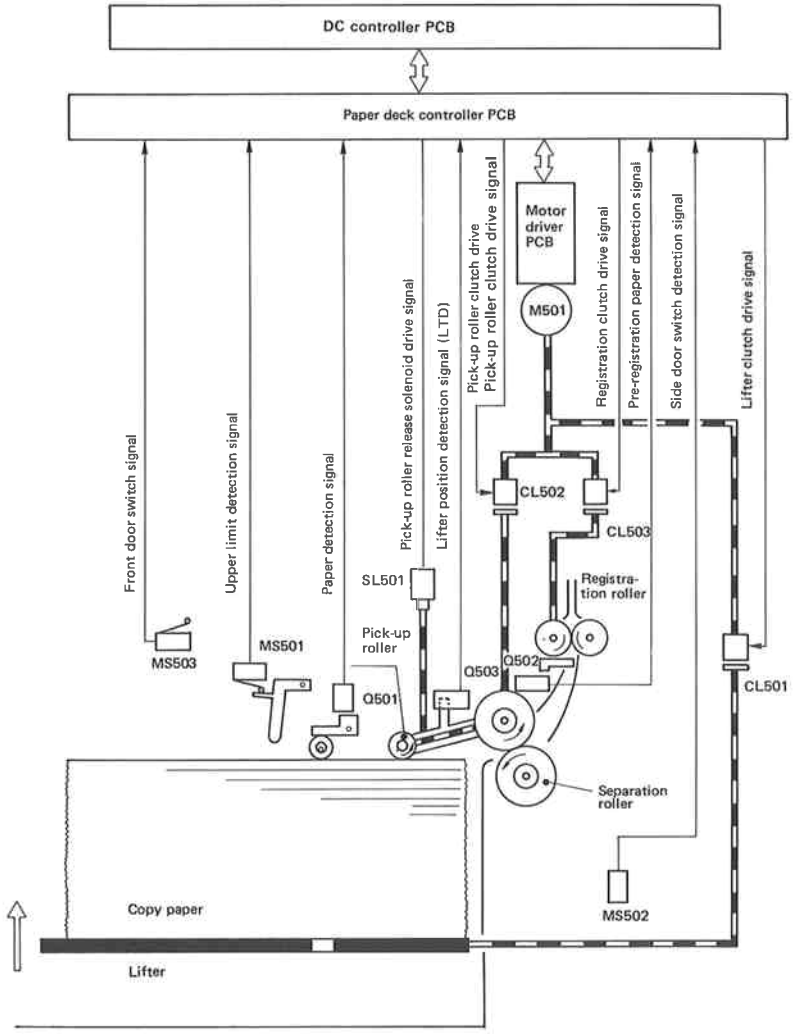

Figure 3-92

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D. Pick-up and Feed Operations

The paper deck picks up and feeds the paper in response to the signals from the copying machine.

The paper deck motor (M501) is driven in response to the DKMD signal from the copying machine; drive is then transmitted to the pick-up and registration rollers by way of clutches.

The clutches in turn are under control of the signals from the copying machine.

When paper is picked-up, the pick-up roller is raised by the pick-up roller release solenoid (SL501).

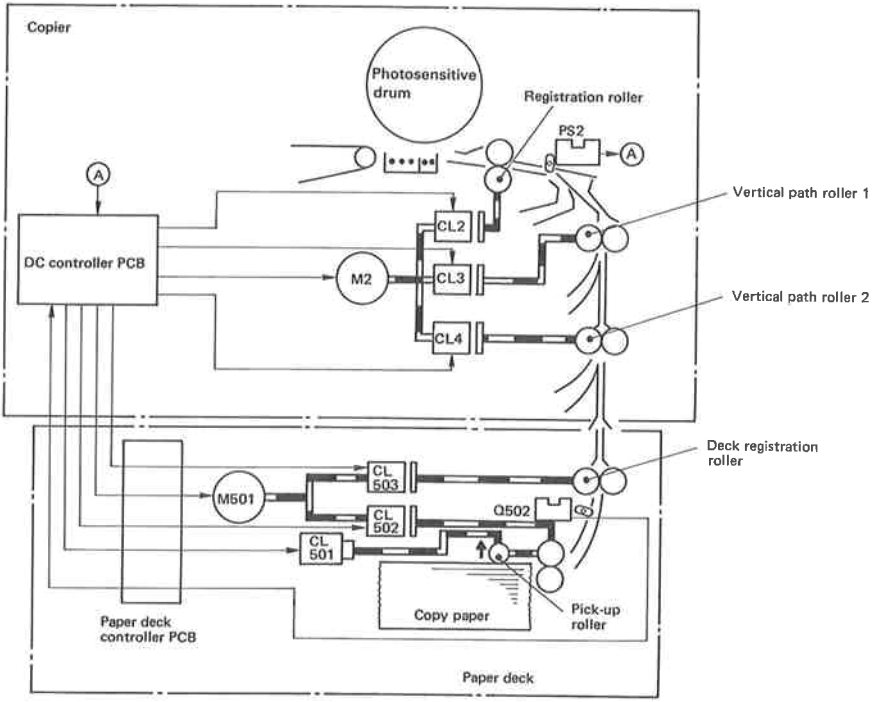

Figure 3-93

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(1) Sequence of Pick-up and Feed Operations

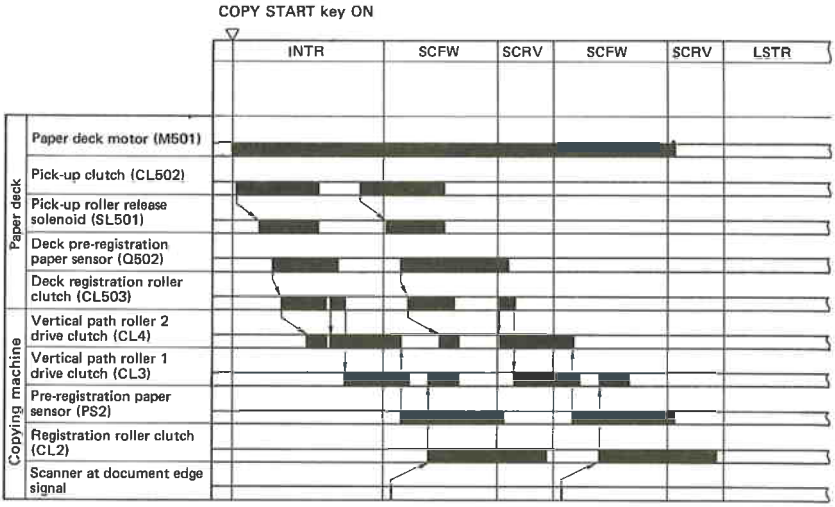

Figure 3-94

NOTE:
With a change in the lens power or replacement of the developing assembly, the paper deck motor (M501) starts to rotate after the change or replacement.

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E. Lifter Operations

1. Moving the Lifter Up

① The lifter is raised when all the following conditions are met:

- Power is available from the copying machine.
- The paper deck is installed (MS503 is ON).
- The side door is closed (MS502 is ON).
- The lifter position signal (LTD) is '0' (sensor arm not at Q503).
- The lifter upper limit sensor (MS501) is OFF.

② As soon as a length of about 2 mm of copy paper (20 sheets of 60 g/m2) is fed, the sensor arm moves away from the lifter position sensor (Q503). In turn, the lifter position detection signal ('0') is generated to raise the lifter by about 2 mm.

2. Stopping the Lifter (normal, emergency)

When the lifter has moved up and, as a result, the paper pushes up the sensor arm, the sensor arm blocks the position sensor (Q503).

The condition causes the position detection signal to go '1' and stops the lifter.

Should the lifter keep moving up after the sensor has blocked the position detection sensor, the sensor arm will press the microswitch (MS501) to stop the lifter.

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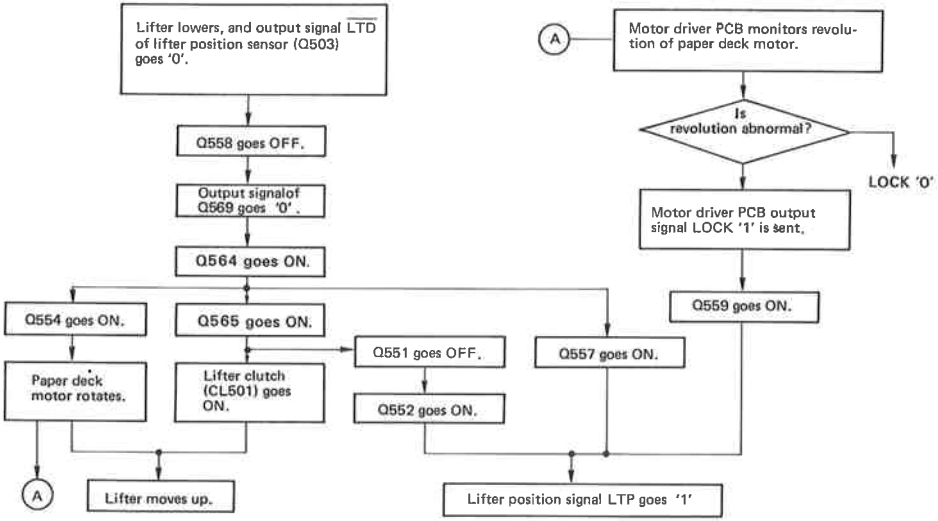
3. Controlling the Lifter Movement (upward)


Lifter lowers, and output signal LTD of lifter position sensor (Q503) goes '0'.
Q558 goes OFF.
Output signalof Q569 goes '0'.
Q564 goes ON.
Q554 goes ON.
Q565 goes ON.
Paper deck motor rotates.
Lifter clutch (CL501) goes ON.
A
Lifter moves up.
Q551 goes OFF.
Q552 goes ON.
Q557 goes ON.
Lifter position signal LTP goes '1'
A
Motor driver PCB monitors revolution of paper deck motor.
Is revolution abnormal?
LOCK '0'
Motor driver PCB output signal LOCK '1' is sent.
Q559 goes ON.

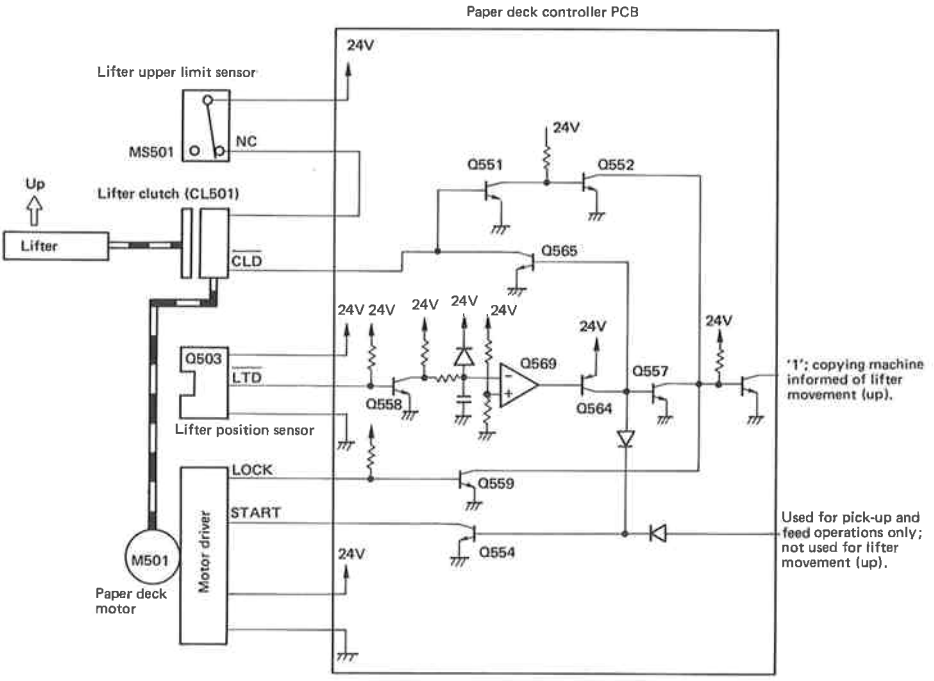


Figure 3-95

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F. Releasing the Pick-Up and Separation Rollers

The paper deck is of a front loading type; as such, the deck is pulled out for a supply of paper.

When the deck is pulled out, the pick-up and separation rollers are released; this design facilitates positioning of the deck and clearing of jams.

1. Releasing the Pick-Up Roller

The pick-up roller is released as soon as the grip of the deck is pulled.

When the latch on the grip comes off the cam on the edge of the roller release shaft, the arm on the roller release shaft rises and the pick-up roller, in turn, is raised.

On the other hand, when the latch on the grip pushes up the cam upon insertion of the deck, the arm lowers and, in turn, the pick-up roller is lowered.

The arm is also used to release the pick-up roller during pick-up operation.

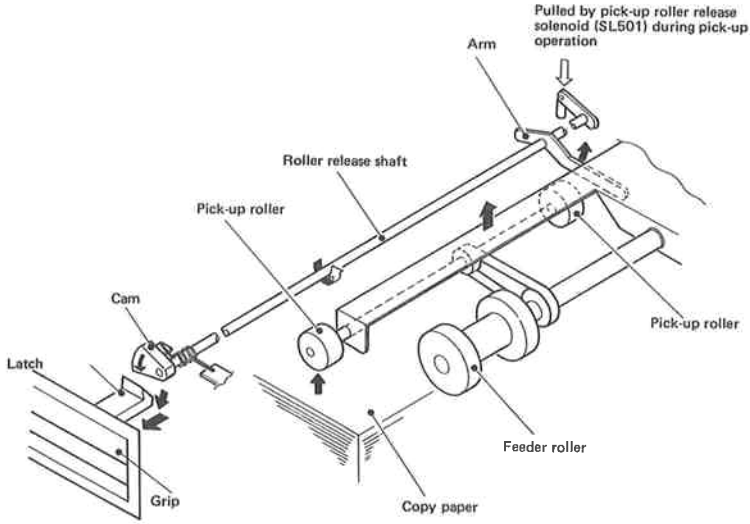

Figure 3-96

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2. Releasing the Separation Roller

The separation roller is released when the cam on the deck side plate comes off the release lever roller.

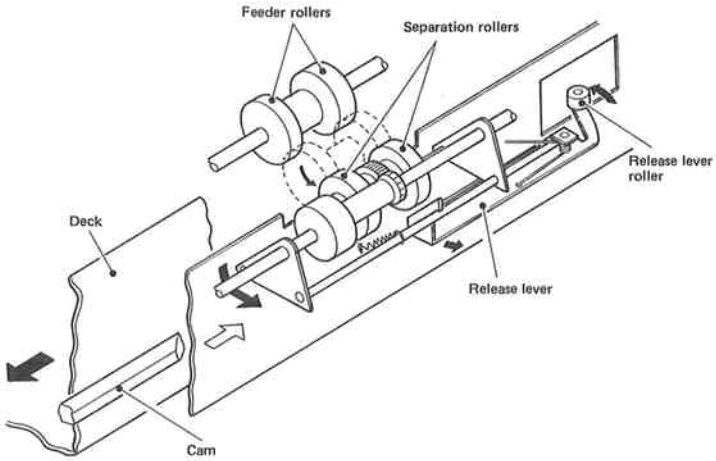

Figure 3-97

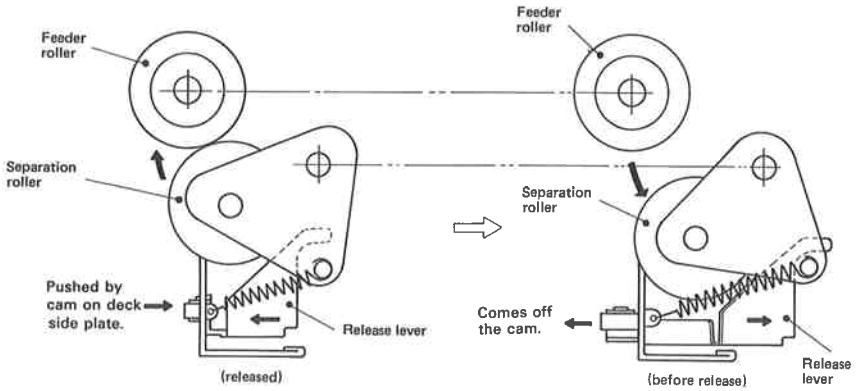

Figure 3-98

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VIII. CASSETTE FEEDING UNIT

A. Electric Circuitry

The cassette feeding unit is controlled by the signals from the copying machine and those from its own controller.

The copying machine sends signals to the controller built inside the cassette feeding unit according to the programed timing.

The controller, in turn, sends signals to drive the motor, clutches, and other loads in response to the signals from the copying machine and those from the microswitches and sensors.

Figure 3-99 shows the relationship between the major circuits of the cassette feeding unit.

The cassette feeding unit receives power from the copying machine and reduces it (24 V) to 12 V.

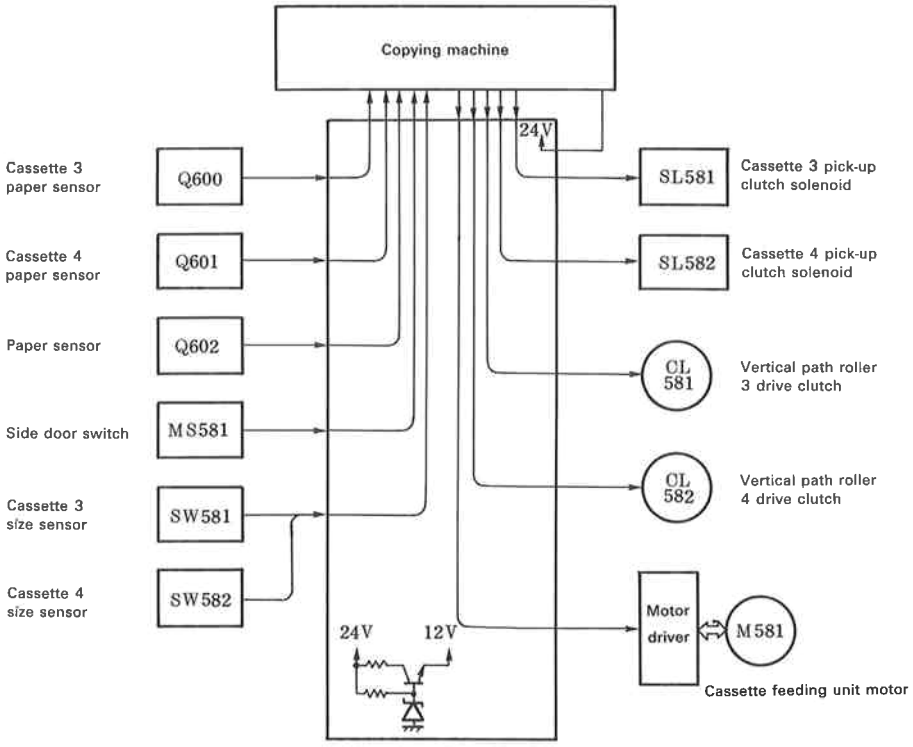

Figure 3-99

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B. Inputs to and Outputs from Cassette Feeding Unit

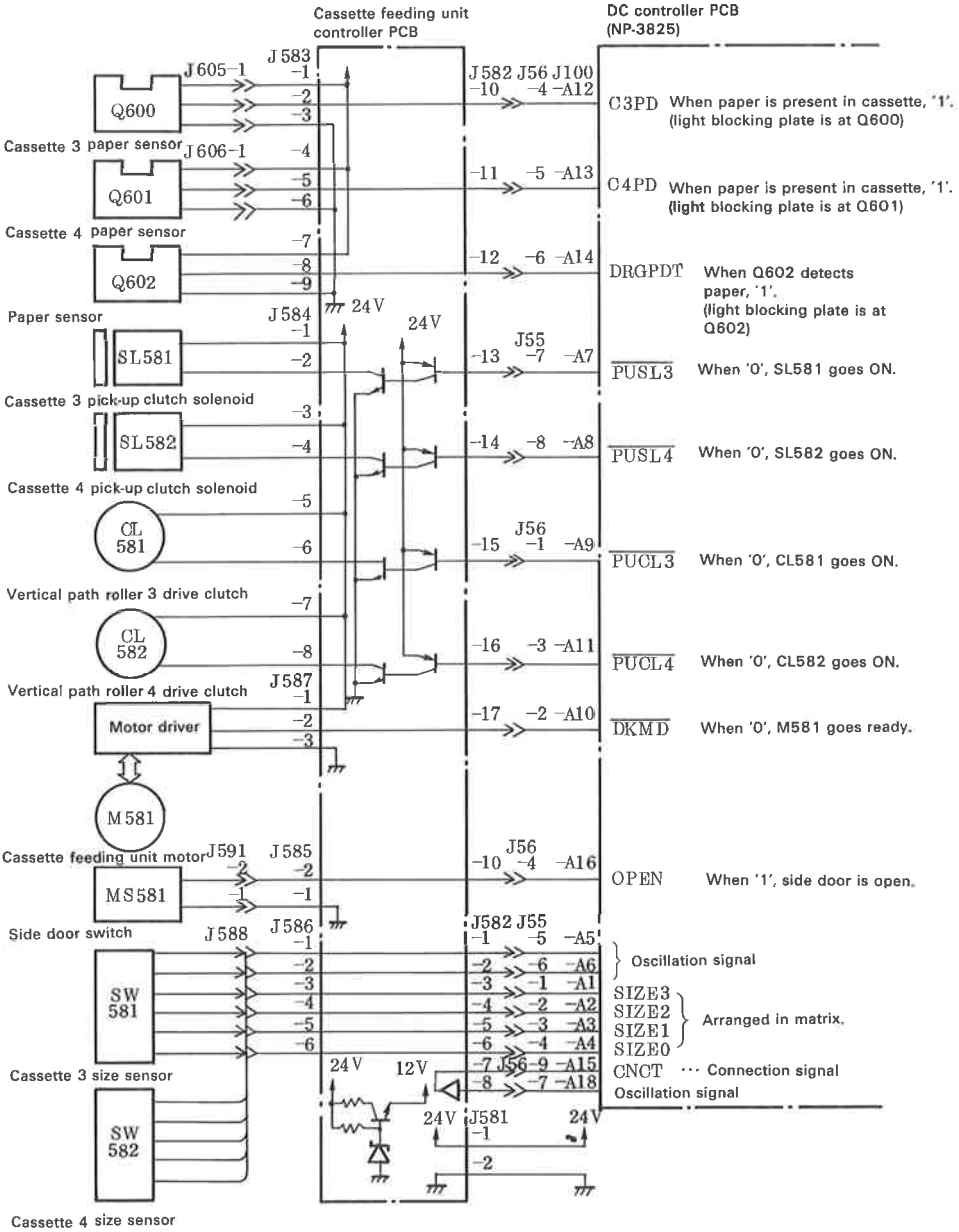

Figure 3-100

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C. Outline

The pick-up rollers of cassettes 3 and 4 and vertical path rollers 3 and 4 are driven by the cassette feeding unit motor (M581).

The cassette feeding unit motor, clutches, and solenoids are controlled by signals from the copying machine by way of the cassette feeding unit controller PCB.

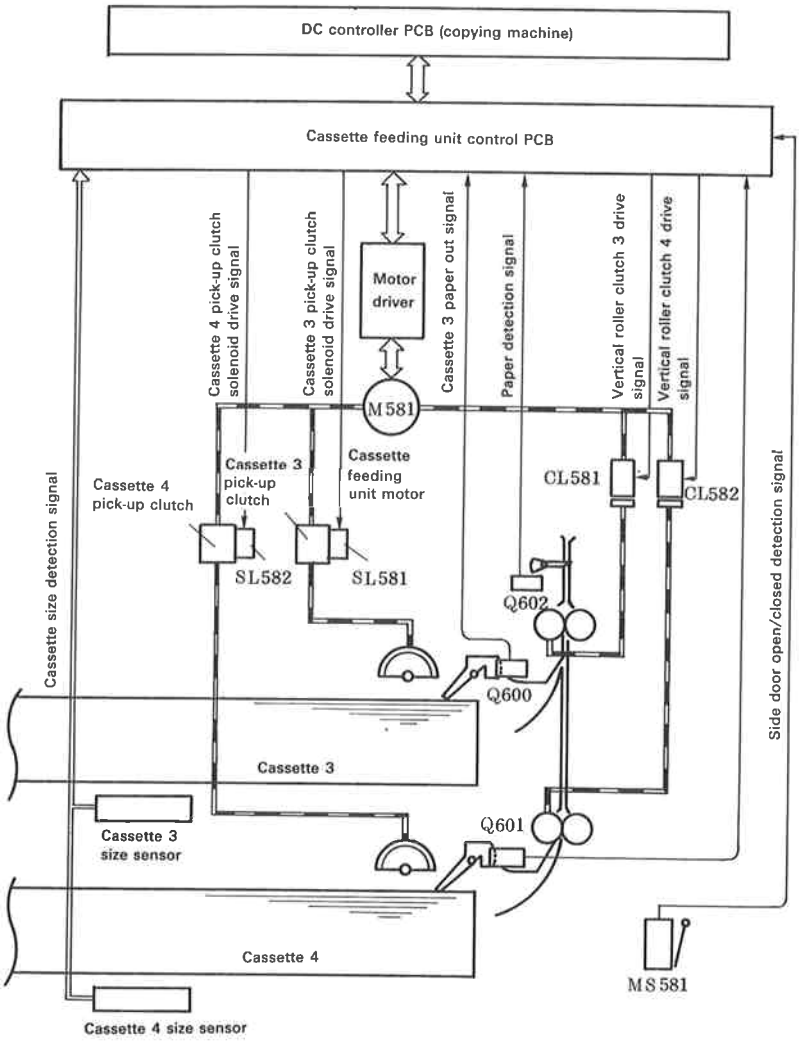

Figure 3-101

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D. Pick-Up and Feed Operations

When the pick-up clutch solenoids (SL581, SL582) and vertical path roller drive clutches (CL581, CL582) go ON while the cassette feeding unit motor (M581) is rotating, the drive of the motor is transmitted to the pick-up roller and vertical roller, and paper is picked up and fed. These operations are controlled by signals from the copying machine.

The copy paper fed into the copying machine are forwarded to the registration roller by vertical rollers 2 and 1.

The paper sensor (Q602) is used to check jams only at time of power-on operation.

Jams at time of pick-up operation from the cassette feeding unit are checked by the pre-registration sensor (PS2) of the copying machine; if the sensor does not detect the paper within the specified time, the copying machine identifies the condition as a delay jam and indicates the fact on the control panel.

The presence/absence of a cassette or the size of the cassette are checked the same way as the copying machine.

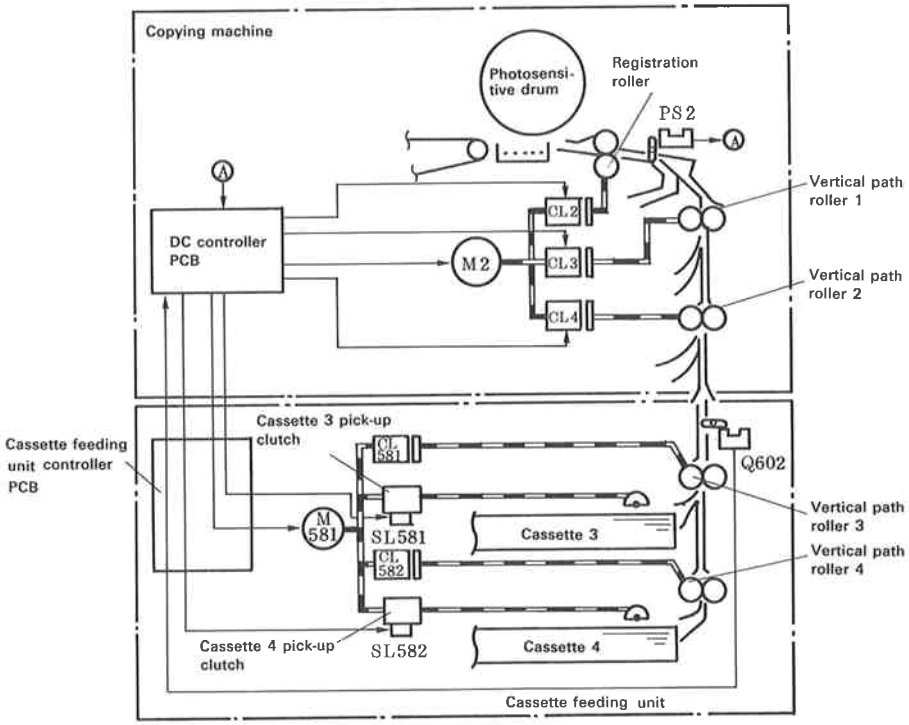

Figure 3-102

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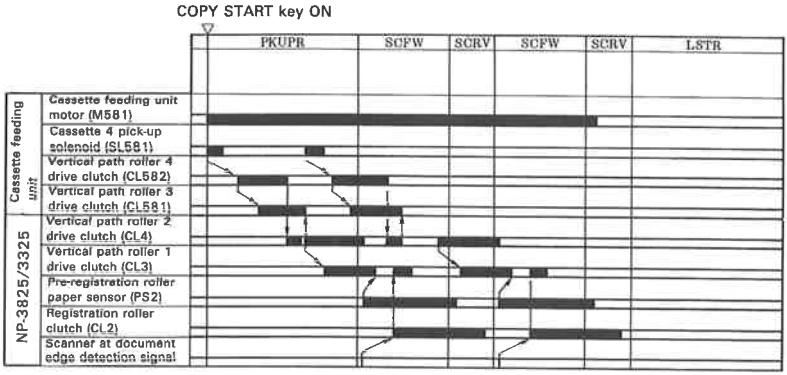
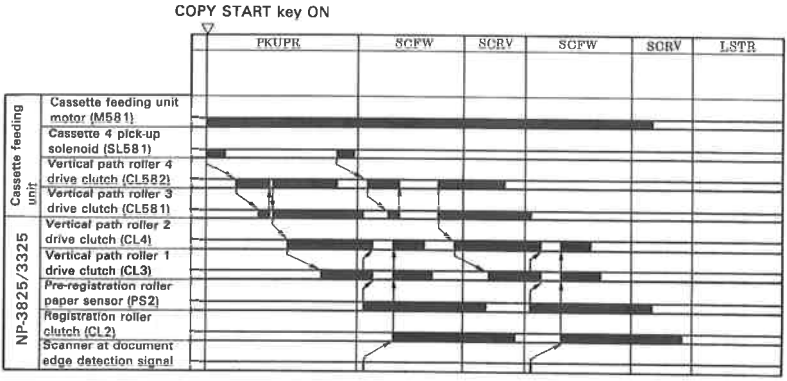
E. Pick-Up from Cassette 4

① A4, LTR



② B4, A4R, LGL, LTR-R



③ A3, 11"X17"

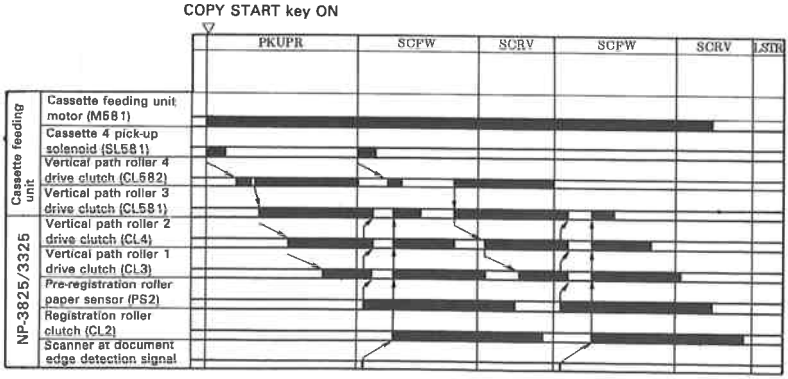


Figure 3-103

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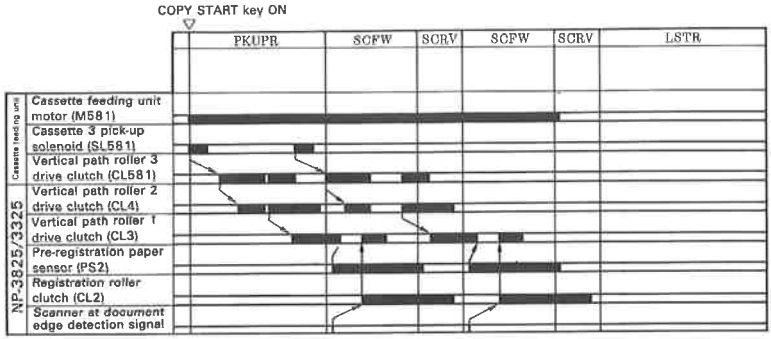
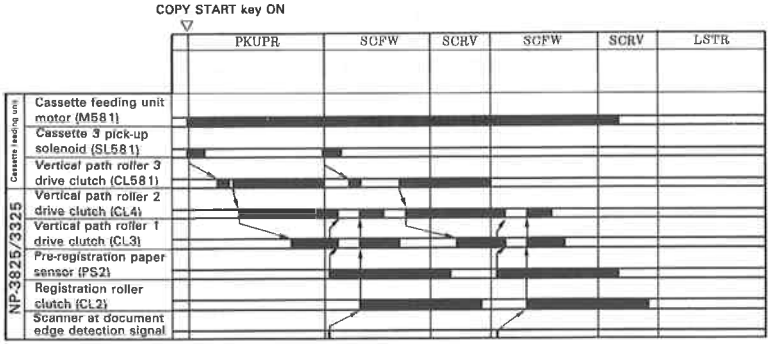
F. Pick-Up from Cassette 3

① A4, LTR



② B4, A4R, LGL, LTR-R



③ A3, 11″×17″

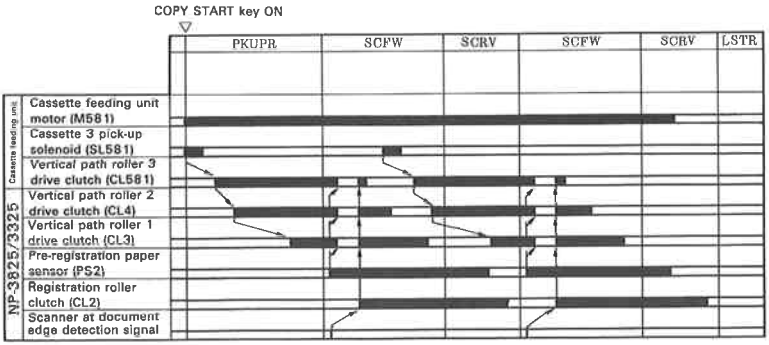


Figure 3-104

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G. Jam Detection

Jams occurring at time of pick-up and feed operations from the cassette feeding unit are checked by the pre-registration sensor (PS2) of the copying machine.

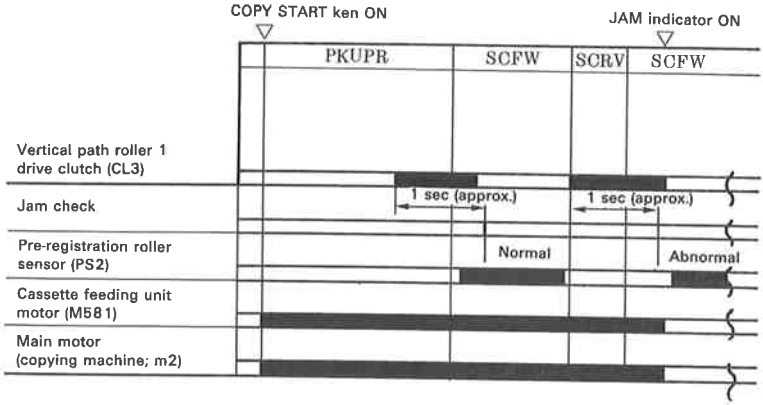

Figure 3-105

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IX. SERVICE MODE

A. Outline

The service mode of the copying machine consists of the following six sub modes.

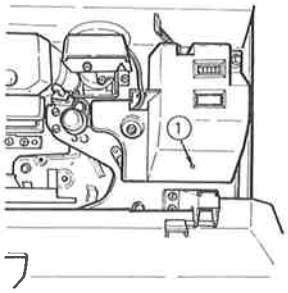
Item	Message	Description
1	DISPLAY	Control display mode
2	I/O DISPLAY	I/O display mode
3	ADJUST	Adjustment mode
4	FUNCTION	Operation/inspection mode
5	USER OPTION	User options mode
6	COUNTER	Counter mode

Table 3-6

B. Operation of Service Mode

1) Open the front door, and insert the door switch actuator; for checks under 'I/O DISPLAY' while making copies, set the copy modes.
2) Press the service mode switch with a hex key.

- The machine enters the service mode and indicates 'S' at the lower right of the message display.



① Service mode switch

Figure 3-106

3) Press the ⊠ key, enter the No. of the mode desired using the NUMBER key, and press the ⊠ key.

EX. ⊠→3→⊠

- The 'ADJUST' screen is displayed.

4) Press the COPY DENSITY key or NUMBER key to select the screen.
5) Make checks or adjustments.
6) Press the RESET key to clear the service mode screen.
7) Press the RESET key once again to leave the service mode.

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C. Making Use of the Adjustment Mode and User Options Mode

With the adjustment and user options modes, the settings made on the control panel can be stored in the RAM of the DC controller PCB and used for the functions normally provided by VRs and switches.

The label shown in Figure 3-107 is a record of the settings made at the factory for each copying machine.

When the DC controller PCB has been replaced or RAM has been cleared, it is important that the settings recorded on the label be entered newly. By the same token, record all new settings which are made in the field.

	TYP		
AE			
RGST			
LEBA			
LIGHT			
LIL-1	7		
LIL-2	14		
DCB-B			
DCB-C			
TRN-1			
TRN-2			
SEP-1			
SEP-2			
AE	100		
S-BLU	100		
S-GRN	100		
S-BRW	100		

Figure 3-107

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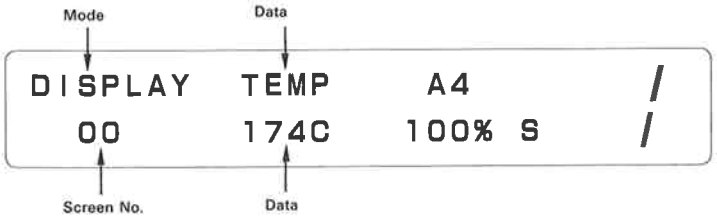
D. Control Display Mode (✱ 1 ✱)

Select the screen using the COPY DENSITY key and NUMBER keys.



Screen	Description	Remarks
00	Temperature of the fixing upper roller (output of thermistor)	(unit: °C)
01	ROM (Q104) version of the DC controller PCB	
02	ROM version of the document feeder	
03	ROM version of the sorter	
04	AE data (output of AE sensor)	Displays 0 through FF.
05	Jam code on the copying machine	See next page.
06	Jam code on the document feeder	See next page.
07	Jam code on the sorter	See next page.
08	Input coordinates of the editor	Displays in 0.1-mm increment
09	Document size checked	

Table 3-7

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Code	Type
01	Delay jam identified by pre-registration paper sensor (PS2)
02	Delay jam identified by delivery sensor (PS6)
04	Stationary jam identified by delivery sensor (PS6)
08	Delay jam identified by lower feeder unit inlet paper sensor (PS7)
10	Stationary jam identified by lower feeder unit inlet paper sensor (PS7)
20	Delay jam identified by deck pre-registration sensor (Q502)
40	Jam in sorter
80	Door opened during copy operation
81	Paper detected by pre-registration sensor (PS2) at power-on
82	Paper detected by delivery sensor (PS6) at power-on
83	Paper detected by lower feeder unit inlet sensor (PS7) at power-on
84	Paper detected by lower feeder unit outlet paper sensor (PS8) at power-on
85	Paper detected by manual feed pick-up sensor (PS11) at power-on
86	Paper identified by paper sensor (Q602) at power-on
87	Power turned OFF and then ON during copy operation

Table 3-8 Jam Codes on Copying Machine

Code	Type
03	Delay jam identified by paper sensor
04	Stationary jam identified by paper sensor
05	Timing jam identified by paper sensor
06	Staple jam
07	Upon power-on and when sensor detects paper
08	When joint switch or cover switch is OFF during copy operation

Table 3-9 Sorter Jam Codes

Code	Type
01	When document is pulled out during pick-up
02	Delay jam identified by pick-up sensor
03	Delay jam identified by registration/skew sensor
04	Leading edge skew jam identified by registration/skew sensor
05	Stationary jam identified by registration/skew sensor
06	Double feeding identified by registration/skew sensor
07	Trailing edge skew jam identified by registration/skew sensor
11	Delay jam 1 identified by reversal sensor
12	Stationary jam identified by reversal sensor
13	Delay jam 2 identified by reversal sensor
20	Initial stationary jam identified by reversal sensor
21	Reversal pick-up delay jam identified by registration/skew sensor
22	Reversal pick-up delay jam identified by registration/skew sensor
23	Reversal pick-up stationary jam identified by registration/skew sensor
24	Reversal trailing edge skew jam identified by registration/skew sensor
41	Delay jam identified by delivery sensor
42	Stationary jam identified by delivery sensor
81	Open/closed detection
82	Feed tray or upper cover open detection
83	When sensor does not detect delivery of document
84	When sensor detects document upon pick-up

Table 3-10 Document Feeder Jam

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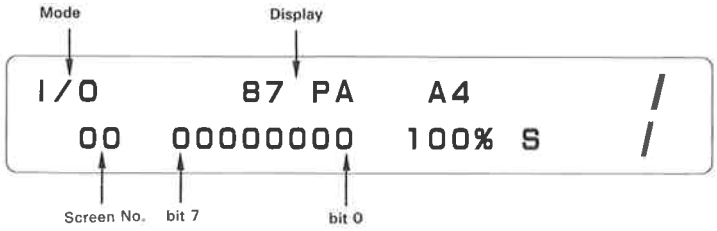
E. I/O Display Mode (✱2✱)

Select the screen by the COPY DENSITY key and NUMBER keys.

- Checks on eight bits for each port are possible.



Screen No.	Display	Description		Remarks
00	87-PA	Master CPU (Q101)	I/O of port PA	
01	87-PB		I/O of port PB	
02	87-PC		I/O of port PC	
03	CS0-PA	I/O port IC (Q106)	I/O of port PA0	
04	CS0-PB		I/O of port PB0	
05	CS0-PC		I/O of port PC0	
06	CS1-PA		I/O of port PA1	
07	CS1-PB		I/O of port PB1	
08	CS1-PC		I/O of port PC1	
09 through 16	KEYR-0 through KEYR-7		Key matrix	
17	SLAVE	Input for slave CPU (Q102)		
18	ORGSIZE	Input of document size sensor		
19	OP-IN	For factory use.		

■ For details, see the next page.

Table 3-11

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Display	Bit	Description	Signal	Jack No.	Remarks
87-PA	0	Cassette 3 pick-up solenoid (SL581) drive signal	$\overline{PUSL3}$	J100-A7	1: Solenoid is ON.
	1	Cassette 4 pick-up solenoid (SL582) drive signal	$\overline{PUSL4}$	J100-A8	1: Solenoid is ON.
	2	Vertical path roller 3 drive clutch (CL581) drive signal	$\overline{FDCL3}$	J100-A9	1: Clutch is ON.
	3	Deck motor (M581) drive signal	$\overline{DKMD}$	J100-A10	1: Motor is ON.
	4	Vertical path roller 4 drive clutch (CL582) drive signal	$\overline{FDCL4}$	J100-A11	1: Clutch is ON.
	5	Main motor clock signal	$\overline{DMDEAD}$	From PLLIC	1: Motor clock
	6	Fan drive signal	$\overline{FMD}$	J104-A1	1: Fan is ON.
	7	For factory use.	–	J113-1	–
87-PB	0	Blank exposure lamp control signal 0	BLKCMD0	To slave CPU (blank)	Control is by combination of BLKCMD 0 through 2.
	1	Blank exposure lamp control signal 1	BLKCMD1	To slave CPU (blank)	
	2	Blank exposure lamp control signal 2	BLKCMD2	To slave CPU (blank)	
	3	For factory use.	–	J113-3	–
	4	Scanner motor (PM1) drive command	SCMCMD	To slave CPU (motor)	
	5	Side registration motor (PM4) drive command	SRMCMD	To slave CPU (motor)	
	6	Set-back roller drive command	SBRCMD	To slave CPU (motor)	
	7	Scanner motor drive ON signal	SCMBSY	From slave CPU (motor)	1: Motor is ON.
87-PC	0	Serial communication signal (transmission)	TXD	To gate array	During communication, alternately, '1' and '0'.
	1	Serial communication signal (reception)	RXD	From gate array	During communication, alternately '1' and '0'.
	2	Communication request signal 1	REQ1	To slave CPU (blank)	1: Communication requested.
	3	Communication acknowledge signal 1	ACK1	To slave CPU (blank)	1: Communication acknowledged.
	4	Communication request signal 1	REQ2	To slave CPU (motor)	1: Communication requested.
	5	Communication acknowledge signal 2	ACK2	From slave CPU (motor)	1: Communication acknowledged.
	6	Error detection signal	WDP	To reset IC	When master CPU is normal, alternately '1' and '0'.
	7	Document sensor LED ON signal	OLED	J106-B6	1: LED is ON.

Table 3-12 (1/6)

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Display	Bit	Description	Signal	Jack No.	Remarks
CSO-PA	0	Manual feed pick-up detection signal	$\overline{\text{MNPD}}$	J111-2	0: Paper is present.
	1	Not used.	–	J100-A20	–
	2	Lower feeder unit outlet paper detection signal	$\overline{\text{LTEXPD}}$	J102-A10	0: Paper is present.
	3	Developing assembly engage signal	CDPRS	J107-A10	1: CD unit engaged.
	4	Deck door open signal	DKOPN	J100-A16	1: Door is open.
	5	Right door open signal (manual feed door included)	SDOPN	J111-11	1: Door is open.
	6	Scanner position signal	SCPD	J101-B2	
	7	Total copy counter line broken signal	TCNTBD	J107-B12	
CSO-PB	0	Main motor (M2) drive command	DRMD	• To PLLIC (Q124) • To slave (motor) CPU (Q102)	1: Motor is ON.
	1	Primary corona unit high-voltage output signal	HVPR	J101-B5	1: High voltage is output.
	2	Pre-transfer corona unit high-voltage output signal	HVPT	J101-B4	1: High voltage is output.
	3	Developing bias AC component output signal	HVBAC	J101-B6	1: Bias is output.
	4	High-voltage AC transformer drive signal	HVAC	J101-B7	1: Transformer is ON.
	5	Fixing heater drive signal	HTRD	J101-B18	1: Heater is ON.
	6	Scanning lamp ON signal	LRD	J101-B16	1: Lamp is ON.
	7	Hopper motor (M1) drive signal	HMD	J101-B13	1: Motor is ON.
CSO-PC	0	Registration roller clutch (CL2) drive signal	$\overline{\text{RGCL}}$	J102-B5	1: Clutch is ON.
	1	Lower feeder unit outlet roller clutch (CL1) drive signal	$\overline{\text{LTEXCL}}$	J102-B3	1: Clutch is ON.
	2	Cleaning belt solenoid (SL2) drive signal	$\overline{\text{WEBSL}}$	J101-B9	1: Solenoid is ON.
	3	Developing assembly engage solenoid (SL3) drive signal	$\overline{\text{CEVSL}}$	J102-B1	1: Solenoid is ON.
	4	Color toner supply solenoid (SL1) drive signal	$\overline{\text{CTSL}}$	J104-B1	1: Solenoid is ON.
	5	Color toner detection lamp ON signal	CTLON	J104-B12	1: Lamp is ON.
	6	Delivery feed motor (PM3) drive signal	EXMD	To slave CPU (motor)	1: Motor is ON.
	7	Delivery feed motor reverse signal	EXMRV	To slave CPU (motor)	1: Motor is in normal rotation. 0: Motor is in reverse rotation.

Table 3-12 (2/6)

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Display	Bit	Description	Signal	Jack No.	Remarks
CS1-PA	0	Cassette 1 paper detection signal	C1PD	J111-5	1: Paper is present.
	1	Cassette 2 paper detection signal	C2PD	J111-8	1: Paper is present.
	2	Cassette 3 paper detection signal	C3PD	J100-A12	1: Paper is present.
	3	Cassette feeding unit pre-registration paper signal	DRGPDT	J100-A14	1: Paper is present.
	4	Cassette 4 paper detection signal	C4PD	J100-A13	1: Paper is present.
	5	Pre-registration paper detection signal	RGPD	J107-B10	1: Paper is present.
	6	Delivery detection signal	$\overline{\text{EXPD}}$	J101-A24	0: Paper is present.
	7	Lower feeder unit inlet paper detection signal	$\overline{\text{LTENPD}}$	J101-B24	0: Paper is present.
CS1-PB	0	Cassette 1 pick-up solenoid (SL4) drive signal	C1PUSL	J100-B14	1: Solenoid is ON.
	1	Cassette 2 pick-up solenoid (SL6) drive signal	C2PUSL	J100-B12	1: Solenoid is ON.
	2	Vertical path roller 1 clutch (CL3) drive signal	FR1CL	J100-B16	1: Clutch is ON.
	3	Vertical path roller 2 clutch (CL4) drive signal	FR2CL	J100-B18	1: Clutch is ON.
	4	Manual feed pick-up solenoid (SL5) drive signal	MNSL	J100-B1	1: Solenoid is ON.
	5	Not used.	–	J107-A12	–
	6	AC load power supply stop signal	ACCUT	J101-A18	1: AC load power supply is stopped.
	7	Counter drive signal	TCNT1	J107-B12	1: Counter is ON.
CS1-PC	0	Toner color signal 1	CT1	J104-B9	
	1	Toner color signal 2	CT2	J104-B7	
	2	Toner color signal 3	CT3	J104-B8	
	3	Color toner out signal 1	CTEP1	J104-B10	0: Toner is absent.
	4	Color toner out signal 2	CTEP2	J104-B11	0: Toner is absent.
	5	Control card detection signal	$\overline{\text{CCDT}}$	J107-B4	0: Control card is present.
	6	Black toner out signal	BTEP	J107-A7	0: Toner is absent.
	7	Scanning lamp ON detection signal	LAON	J101-B12	1: Lamp is ON.

Table 3-12 (3/6)

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Display	Bit	Description	Signal	Jack No.	Remarks
KEYR-0	0	NUMBER key [0]	–	–	1: Key is ON.
	1	NUMBER key [1]	–	–	1: Key is ON.
	2	NUMBER key [2]	–	–	1: Key is ON.
	3	NUMBER key [3]	–	–	1: Key is ON.
	4	NUMBER key [4]	–	–	1: Key is ON.
	5	NUMBER key [5]	–	–	1: Key is ON.
	6	NUMBER key [6]	–	–	1: Key is ON.
	7	NUMBER key [7]	–	–	1: Key is ON.
KEYR-1	0	NUMBER key [8]	–	–	1: Key is ON.
	1	NUMBER key [9]	–	–	1: Key is ON.
	2	[C/◇] key	–	–	1: Key is ON.
	3	[◇] key	–	–	1: Key is ON.
	4	[〃] key	–	–	1: Key is ON.
	5	CASSETTE key	–	–	1: Key is ON.
	6	COPY DENSITY [darker] key	–	–	1: Key is ON.
	7	AE key [A]	–	–	1: Key is ON.
KEYR-2	0	COPY DENSITY [lighter] key	–	–	1: Key is ON.
	1	REDUCE key	–	–	1: Key is ON.
	2	DIRECT key	–	–	1: Key is ON.
	3	ENLARGE key	–	–	1: Key is ON.
	4	SORT key	–	–	1: Key is ON.
	5	COLOR key	–	–	1: Key is ON.
	6	[米] key	–	–	1: Key is ON.
	7	STANDBY ◎ key	–	–	1: Key is ON.
KEYR-3	0	PAGE SEPARATION key	–	–	1: Key is ON.
	1	TWO-SIDED key	–	–	1: Key is ON.
	2	OVERLAY key	–	–	1: Key is ON.
	3	ERASING key	–	–	1: Key is ON.
	4	AUTO RATIO key	–	–	1: Key is ON.
	5	ZOOM key [–]	–	–	1: Key is ON.
	6	ZOOM key [+]	–	–	1: Key is ON.
	7	MODE MEMORY key M1	–	–	1: Key is ON.
KEYR-4	0	MODE MEMORY key M2	–	–	1: Key is ON.
	1	Option connect signal	OP-EXST	J100-A18	1: Cassette feeding unit is present.
	2	Waste toner full signal	WTOF	J102-A1	Alternately '1' and '0' when full.
	3	Service mode input push switch (SW501)	SRV	J107-A4	1: Switch is ON.
	4	Document size detection signal 0	0-SIZE0	J106-B1	1: Document is present.
	5	Document size detection signal 1	0-SIZE1	J106-B2	1: Document is present.
	6	Document size detection signal 2	0-SIZE2	J106-B3	1: Document is present.
	7	Copyboard cover open/closed signal	–	–	1: Cover is closed.

Table 3-12 (4/6)

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Display	Bit	Description	Signal	Jack No.	Remarks
KEYR-5	0	Cassette 1 size detection switch	SIZE0	J100-B9	1: Switch is ON.
	1	Cassette 1 size detection switch	SIZE1	J100-B8	1: Switch is ON.
	2	Cassette 1 size detection switch	SIZE2	J100-B10	1: Switch is ON.
	3	Cassette 1 size detection switch	SIZE3	J100-B7	1: Switch is ON.
	4	Cassette 3 size detection switch	OP-SIZE0	J100-A4	1: Switch is ON.
	5	Cassette 3 size detection switch	OP-SIZE1	J100-A3	1: Switch is ON.
	6	Cassette 3 size detection switch	OP-SIZE2	J100-A2	1: Switch is ON.
	7	Cassette 3 size detection switch	OP-SIZE3	J100-A1	1: Switch is ON.
KEYR-6	0	Cassette 2 size detection switch	SIZE0	J100-B9	1: Switch is ON.
	1	Cassette 2 size detection switch	SIZE1	J100-B8	1: Switch is ON.
	2	Cassette 2 size detection switch	SIZE2	J100-B10	1: Switch is ON.
	3	Cassette 2 size detection switch	SIZE3	J100-B7	1: Switch is ON.
	4	Cassette 4 size detection switch	OP-SIZE0	J100-A4	1: Switch is ON.
	5	Cassette 4 size detection switch	OP-SIZE1	J100-A3	1: Switch is ON.
	6	Cassette 4 size detection switch	OP-SIZE2	J100-A2	1: Switch is ON.
	7	Cassette 4 size detection switch	OP-SIZE3	J100-A1	1: Switch is ON.
KEYR-7	0	Fixed reproduction ratio model code	–	–	See the table below.
	1	Fixed reproduction ratio model code	–	–	
	2	Color copy count	C-CNT	–	1: Count
	3	Not used.	–	–	–
	4	Not used.	–	–	–
	5	Not used.	–	–	–
	6	Not used.	–	–	–
	7	Not used.	–	–	–

	KEYR7-0	KEYR7-1
4R4E-AB	0	0
4R3E-Inch	1	0
2R2E-A	0	1
4R3E-Inch/AB	1	1

Table 3-12 (5/6)

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Display	Bit	Description	Signal	Jack No.	Remarks
SLAVE	7	Not used.	–	–	–
	1	Side registration paper edge detection signal	SRGPD	J107-B7	1: Paper edge is detected.
	2	Not used.	–	–	–
	3	Not used.	–	–	–
	4	Not used.	–	–	–
	5	Not used.	–	–	–
	6	Not used.	–	–	–
	0	Lens home position detection signal	LHP	J101-A21	1: Lens is at home position.
ORGSIZE	0	Document size detection signal 0	0-SIZE0	J106-B1	Data is input when copyboard cover is closed: 0: Paper is present. 1: Paper is absent.
	1	Document size detection signal 1	0-SIZE1	J106-B2	
	2	Document size detection signal 2	0-SIZE2	J106-B3	
	3	Not used.	–	–	–
	4	Not used.	–	–	–
	5	Not used.	–	–	–
	6	Not used.	–	–	–
	7	Not used.	–	–	–

Table 3-12 (6/6)

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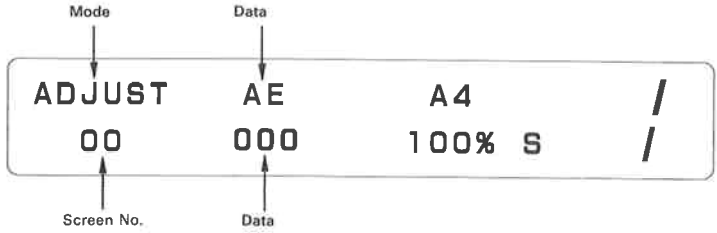
F. Adjustment Mode (✱ 3 ✱)

- Select the screen using the COPY DENSITY key.
- Enter settings using the NUMBER keys.
- Register the settings using the ✱ key; settings outside the range will not be accepted.



Screen No.	Item	Description	Range	Remarks
00	AELIL	Intensity at time of AE measurement	0~999	When the setting is decreased, the copies in the AE will be lighter.
01	RGST	Leading edge margin (timing for registration roller ON)	0~999	When the setting is increased, the registration roller will go ON later. (unit: 0.323 mm)
02	LEBA	Leading edge non-image width	0~999	When the setting is increased, the leading edge non-image width will increase. (unit: 0.41 mm)
03	LIGHT	Intensity for copy density 5 (effective both for manual and AE)	0~999	When the setting is increased, the copies will be lighter. (unit: 0.1 V)
04	LIL_1	Slope for copy density 6 or less	0~999	When the setting is increased, the scanning lamp intensity for copy density 1 will decrease.
05	LIL_2	Slope for copy density 6 or more	0~999	When the setting is increased, the scanning lamp intensity for copy density 9 will increase.
06	DCB_B	Developing bias (DC component) for black copy	0~999	When the setting is decreased, the bias will decrease (approaches 0) and copies will be darker. (unit: 1 V)
07	DCB_C	Developing bias (DC component) for color copy		

Table 3-13 (1/2)

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Screen No.	Item	Description	Range	Remarks
08	TRN_1	Transfer current	0~999	When the setting is decreased, the current will decrease. (unit: 1μA)
09	TRN_2	Transfer current for 2nd face for overlay/two-sided copy		
10	SEP_1	Separation current	0~999	When the setting is increased, the current will increase. (unit: 1μA)
11	SEP-2	Separation current for 2nd face for overlay/two-sided copy		
12	AE	AE slope	0~999	When the setting is increased, the copies of a newspaper will be lighter.
13	S_BLU	Developing bias (DC component) difference for each color copy	0~999	The difference between DCB_C (red) and each of other colors will be established; median is 100. (unit: 1V)
14	S_GRN			
15	S_BRW			

Table 3-13 (2/2)

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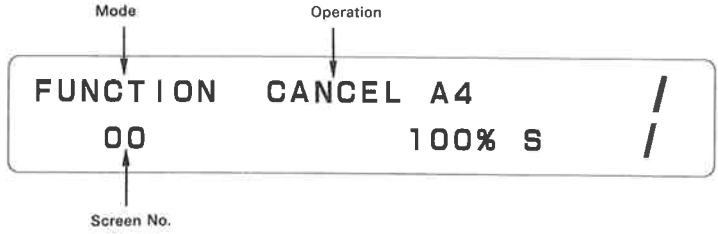
G. Operation/Inspection Mode (✱ 4 ✱)

- Select the screen using the COPY DENSITY key and NUMBER keys.
- Press the ✱ key to start operation.
  Be sure that the operation for each item is executed in the standby mode only.



Screen No.	Item	Description	Remarks
00	CANCEL	Suspension of operation (BLANK, SBMTR)	–
01	BLANK	Blank exposure lamp ON check	The lamp remains ON for 10 sec.
02	SBMTR	Set-back roller drive motor operation check	The motor rotates for 10 sec.
03	SRGINT	Side registration motor operation check	Initial operation is executed.
04	HOPM_D	Hopper motor operation check	The motor rotates for 5 sec.
05	SC_INT	Scanner motor operation check	Initial operation is executed.
06	DEV_RES	Black developing assembly disengagement/CD unit engagement	–
07	CD_SET	CD unit installation idle mode	Do not execute the item except at time of installation.
08	AE_ADJ	AE scan intensity	See "STANDARDS AND ADJUSTMENT."
09	ERROR	E000, E001, E002, E003 clear	–
10	RAMINT	RAM data initialization	Execute the item only after replacement of the DC controller; after execution, enter settings (* 3 *, etc.) according to the label. The item clears all count memory on the DC controller.
11	LED_CK	Control panel LEDs ON check	The LEDs remain ON for 10 sec.
12	CDSLD	Color toner supply solenoid operation check	The solenoid remains ON for 0.5 sec.

Table 3-14

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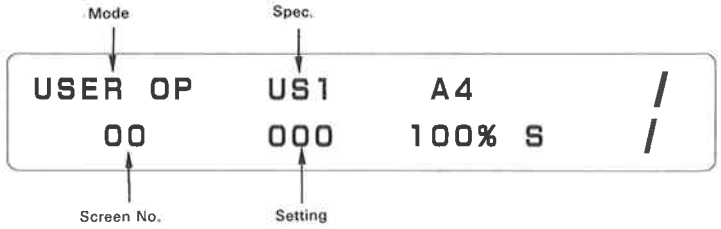
H. User Options Mode (* 5 *)

- Select the screen using the COPY DENSITY key.
- Enter settings using the NUMBER keys.
- Register the settings using the * key.



Screen No.	Spec.	Function	Description	Remarks
00	US1	Size registration for universal cassette	Registers the size of paper to be used in the universal cassette; registration enables the use of the auto reproduction ratio selection mechanism.	
01	US2			
02	UL1			
03	UL2			
04	AESLCT	Establishment of standard modes	1: AE enabled. 0: AE disabled.	All numerals other than '0' will be regarded as '1'.
05	C_SLCT		0: Auto cassette mechanism is selected. 1: Cassette 1 is selected. 2: Cassette 2 is selected. 3: Cassette 3 is selected. 4: Cassette 4 is selected.	All numerals higher than '5' will be regarded as '0'
06	ACSLCT	Auto cassette change mechanism enabled/ disabled	When the cassette runs out of paper during continuous copy operation, a cassette with paper of the same size will be selected automatically if the auto cassette change mechanism is enabled. 0: Auto cassette change mechanism is disabled. 1: Auto cassette change mechanism is enabled.	All numerals other than '0' will be regaded as '1'.

Table 3-15 (1/2)

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Screen No.	Spec.	Function	Description	Remarks
07	AS_OFF	Auto shut-off mechanism enabled/disabled	Enables or disables the auto shut-off mechanism (2 hr). 1: Auto shut-off mechanism is enabled. 0: Auto shut-off mechanism is disabled.	All numerals other than '0' will be regarded as '1'.
08	MSGOFF	Warning message enabled/disabled	The warning messages for auto reproduction/auto cassette change mechanism may be enabled or disabled. 1: Message is enabled. 0: Message is disabled.	All numerals other than '0' will be regarded as '1'.

Table 3-15 (2/2)

<US1/US2>

Paper size	Setting
Government LETTER	001
Government LETTER R	002
Korean Government	003
Korean Government R	004
Argentine LETTER	005
Argentine LETTER R	006

<UL1/UL2>

Paper size	Setting
Government LEGAL	007
Argentine LEGAL	008
FOLIO	009
FOOLSCAP	010
Australian FOOLSCAP	011
OFICIO	012
Equadoran OFICIO	013
Bolivian OFICIO	014

Table 3-16

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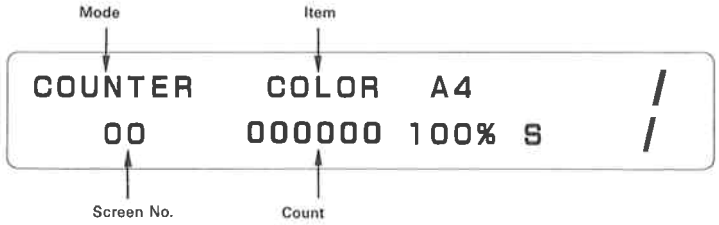
I. Counter Mode (* 6 *)

- Select the screen using the COPY DENSITY key.
- Press the *, 0, and CLEAR keys [C/S] to clear the counter in question.



Screen No.	Item	Description	No. of digits (max.)
00	COLOR	Color copy counter	999999 (returns to 000000 thereafter)
01	RED	Red copy counter	
02	BLUE	Blue copy counter	
03	GREEN	Green copy counter	
04	RROWN	Brown copy counter	
05	WEB	Cleaning belt drive solenoid operations counter	
06	CNTR1	Manual feed pick-up counter	
07	CNTR2	Cassette 1 pick-up counter	
08	CNTR3	Cassette 2 pick-up counter	
09	CNTR4	Cassette 3 pick-up counter	
10	CNTR5	Cassette 4 pick-up counter	
11	CNTR6	Paper deck pick-up counter	
12	CNTR7	Two-sided copy pick-up counter (from lower feeder unit)	

Table 3-17

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X. SELF-DIAGNOSIS

The copying machine is equipped with a mechanism which checks its own condition by the microprocessor on the DC controller. When a problem is found, it indicates it on the control panel (display) in the form of a code. Refer to the table below for interpretation of the codes.

Code	Cause	Timing
E000	• Thermistor (TH1) • Heater (H1) • Thermal fuse (FU2) • SSR • DC controller PCB	• The output of TH1 fails to reach 100°C within 140 sec after the power is turned ON. (See notes 1 and 2.)
E001	• Thermistor (TH1) • SSR • DC controller PCB	The output of TH1 exceeds 200°C. (See notes 1 and 2.)
E002	• Thermistor (TH1) • Heater (H1) • Thermal fuse (FU2) • DC controller PCB	• The output of TH1 fails to reach 170°C within 100 sec after it has reached 100°C. • The output of TH1 fails to reach 175°C within 40 sec after it has reached 170°C.
E003		• The output of TH1 drops below 150°C after warm-up. (See notes 1 and 2.)
E010	• Main motor (M2) • Motor driver PCB • DC controller PCB	The main motor signal (DMDEAD) remains '1' for 1 sec after the main motor drive signal is generated.
E022	• Developing assembly engagement sensor (PS3) • Developing assembly engagement solenoid (SL3) • DC controller PCB	• The CD unit remains engaged 1.6 sec after the black developing assembly is selected; the output of the develoing engagement sensor (PS3) is '1'. • The black developing assembly remains engaged 1.6 sec after the CD unit is selected; PS3 is '0'.
E030	• Counter (CNT1) • DC controller PCB	Normal if the counter drive signal is '0' when the counter goes ON; normal if the counter drive signal is '1' when the counter goes OFF.
E202	• Scanner motor (PM1) • DC controller PCB • Scanner home position sensor (PS5)	• The scanner initial operation fails to complete within 10 sec after the POWER switch is turned ON. In the following conditions, no error code is indicated but all keys on the control panel will be locked. • The AE reverse operation fails to complete within 3 sec. • The reverse operation fails to complete within 5 sec after exposure.
E204	• Scanner motor (PM1) • DC controller PCB • Scanner home position sensor (PS5)	• The AE advance operation fails to complete within 3 sec. • The advance operation fails to complete within 5 sec after exposure.

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Code	Cause	Timing
E2 10	• Lens home position sensor (PS4) • Lens motor (M3) • Lens cable • DC controller PCB	• The operation in which the lens is set to the DIRECT position takes more than 20 sec after the initial rotation starts. • The operation in which the lens is set to the reproduction ratio set takes more than 15 sec after the COPY START key is pressed.
E220	Scanning lamp (LA1)	• LAON fails to go '1' at the lamp ON timing. • LAON fails to go '0' at the lamp OFF timing.
E240	• DC controller PCB	A communication error occurs between the master CPU (Q101) and slave CPU (Q102, Q103).
E401	• Pick-up motor (M2) • Pick-up roller sensor (S3)	• The pick-up motor (M2) is equipped with a flag on its spindle; the rotation of M1 is monitored with reference to the flag and pick-up roller sensor (S3). The code is issued when S3 fails to go ON/OFF more than twice within 1 sec.
E402	• Belt feed motor (M1) • Belt feed motor clock sensor (S4)	• The number of belt clock pulses within 200 ms is below the specified value.
E404	• Delivery motor (M3) • Delivery motor clock sensor (S2)	• The number of delivery motor clock pulses within 200 ms is below the specified value.
E411	• Document sensor (S6) • Registration paper sensor (S7)	• The output of the sensor is 2.3 V or more in the absence of paper.
E710	• DC controller PCB	The IPC (Q108) cannot be initialized when the POWER switch is turned ON.
E712	• DC controller PCB • DF controller PCB • DF cable	A communication error with the DF cannot be cleared.

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Code	MS5	Sorter VIII	Staple Sorter
E500	• Communication problem between sorter and copying machine.	• Communication problem between sorter and copying machine.	• Communication problem between sorter and copying machine.
E510	• Clock pulses from feeder motor remains 66.7% of reference for 2.4 sec or more.	—	• No pulse is generated by clock sensor (PI6) within 5 sec after motor drive signal is generated.
E530	—		• Home position sensor (PI7) fails to go OFF after motor drive signal is generated for 256 pulses.
E531	—	—	• Stapler unit swing sensor (MS9) fails to go OFF within 500 ms after motor drive signal is generated. • MS9 fails to go ON within 700 ms after it has gone OFF.
E540	• Lead cam home position sensor (PI2) fails to go OFF within 500 ms after motor drive signal is generated. • PI2 fails to go ON within 500 ms after it has gone OFF.	• Lead cam position sensor (PI1) fails to go OFF at all within 0.5 sec after bin motor drive signal is generated.	• Lead cam home position sensor (PI1) fails to go OFF within 500 ms after motor drive signal is generated.
E541	—	• Lead cam position sensor (PI1) fails to go ON within 1.0 sec after it has gone OFF.	—

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Note:

1. The copying machine can be reset by turning the POWER switch OFF when the self diagnosis mechanism has been activated. This, however, will not work when 'E000', 'E001', 'E002', or 'E003' is indicated. To reset the machine, enter the service mode (* 4 *) and execute 'ERROR'; this is to prevent overheating of the rollers within the fixing assembly, likely if the machine is set without replacing the thermistor.
2. 'E000', 'E001', E002', or 'E003' are indicated immediately upon detection of the problem.
3. With codes in the 400's, the self diagnosis mechanism will be activated once again and 'FEEDER FAILURE' will be indicated when the POWER switch is turned OFF and ON. Copies, however, can still be made if the feeder is used as the copyboard cover.
4. With codes in the 500's except 'E500', the self diagnosis mechanism will be activated once again and 'SORTER FAILURE. DETACH SORTER' will be indicated when the POWER switch is turned OFF and ON. Copies, however, can still be made if the sorter is detached (hold the grip and slide it to the left).

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CHAPTER 4

MECHANICAL SYSTEM

1. Disconnect the power cord for safety before disassembly or reassembly work.
2. Group the screws by type (length and diameter) and location.
3. One of the mounting screws used for the rear cover is fitted with a washer to protect against static electricity. Be sure to keep them together for assembly.
4. The mounting screws used for the grounding wire and varistors are fitted with a washer to ensure electrical conductivity. Be sure to use the washer for assembly.
5. If possible, avoid operating the machine with any of its parts removed.
6. Unless otherwise noted, reassembly is the reverse of disassembly.

I. EXTERNALS 4-1
- A. External Covers 4-1
- B. Control Panel 4-3
- C. Copyboard Cover 4-3
- D. Fans 4-3

II. DRIVE SYSTEM 4-5
- A. Lens Drive Unit 4-5
- B. Scanner Drive Unit 4-7
- C. Main Motor Unit 4-9
- D. Pick-Up Drive Unit 4-10
- E. Registration Roller Drive Unit 4-11
- F. Other Drive Units 4-11

III. FEEDER SYSTEM 4-12
- A. Pick-Up Unit 4-12
- B. Feeder Unit 4-16
- C. Lower Feeder Unit 4-19
- D. Delivery Unit 4-21
- E. Cassette Feeding Unit 4-23
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IV. EXPOSURE SYSTEM 4-32
- A. Illumination Unit 4-32
- B. Pre-Exposure Lamp Unit 4-33
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V. CHARGING SYSTEM 4-34
- A. Drum Unit 4-34
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VI. DEVELOPING SYSTEM 4-41
- A. Black Developing Assembly 4-41

VII. FIXING SYSTEM 4-46
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VIII. ELECTRICAL SYSTEM 4-51
- A. DC Controller 4-51

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I. EXTERNALS

A. External Covers

① Left cover (10)
② Upper cover (4)
③ Rear cover (8)
④ Right cover (7)
⑤ Front door
⑥ Lower front cover (3)

Figure 4-100

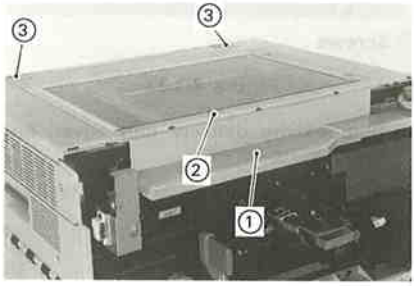
Note:
The number in parentheses indicates the number of mounting screws used.

Remove the covers as necessary, as shown below for cleaning, inspecting, or repairing the inside of the copying machine.

Covers that can be detached by mere removal of the screws are left out of the procedure.

1. Upper Cover

1) Remove the copyboard cover.
2) Remove the control panel; see p. 4-3.
3) Remove the rear cover.
4) Remove the two mounting screws, and remove the copyboard retainer.
5) Remove the copyboard glass.
6) Remove the mounting screw, and remove the magnet plate.
7) Pick the bottom of the bushes (left, right), and push them up to remove.
8) Remove the mounting screw, and remove the upper cover.



① Mounting screw
② Magnet plate
③ Bush

Figure 4-101

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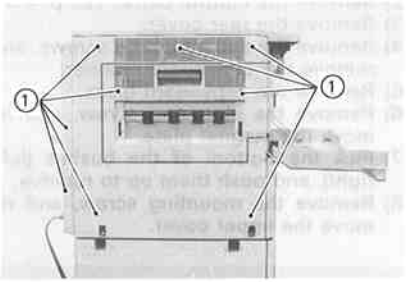
2. Left Cover

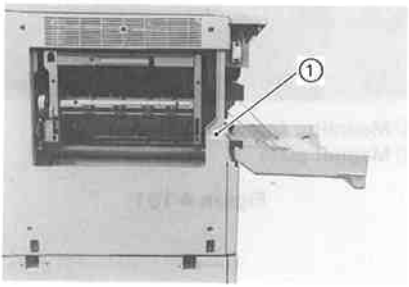
1) Open the front door.
2) Remove the nine screws shown in Figure 4-102.



① Screws

Figure 4-102

3) Remove the delivery unit cover, and remove the screw.



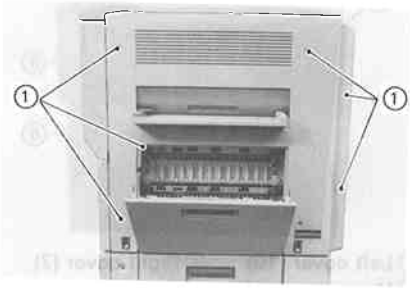
① Screw

Figure 4-103

4) Remove the left cover.

3. Right Cover

1) Remove the seven screws shown in Figure 4-104, and remove the right cover.



① Screws

Figure 4-104

4. Rear Cover

1) Loosen the two screws on the bottom plate until they are just about to come off.
2) Remove the four screws on the left and right.
3) Remove the two screws on the top.

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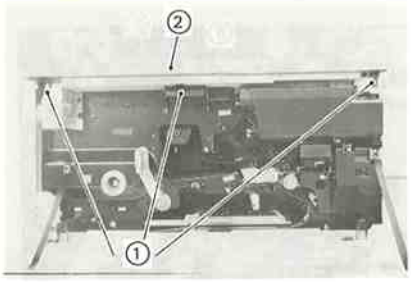
B. Control Panel

1. Removing the Control Panel

1) Open the front door.
2) Remove the door switch cover; two screws.
3) Remove the three screws, and pull up the control panel to the front to remove.



① Screws ② Control panel

Figure 4-105

C. Copyboard Cover

1. Replacing the Lower Plate Sheet

The lower plate sheet is glued to the copyboard retaining plate with adhesive tape on its back. Pull at the corners to remove.

After replacement, press over the lower plate sheet by hand.

D. Fans

1. Outline

The copying machine is equipped with three fan motors which are used to circulate the air inside the machine, thereby preventing temperature increases.

Each of the fan serves the following purpose:
Heat exhaust fan (FM1) blows heat from the fixing assembly outside the machine.
Scanner cooling fan (FM2) cools the scanner.
Feeder fan (FM3) feeds the copy paper.

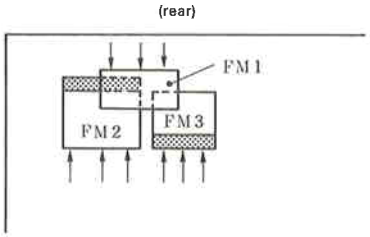
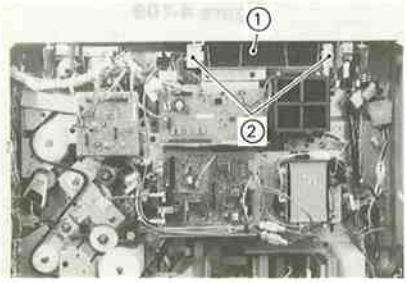


Figure 4-106 (top view)

2. Scanner Cooling Fan (FM2; removing the filter)

Note:
Use a magnetic screwdriver.

1) Remove the rear cover.
2) Remove the two mounting screws, and remove the filter.



① Filter ② Mounting screws

Figure 4-107

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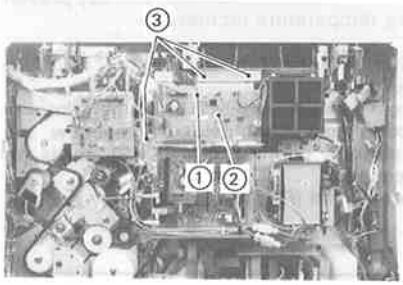
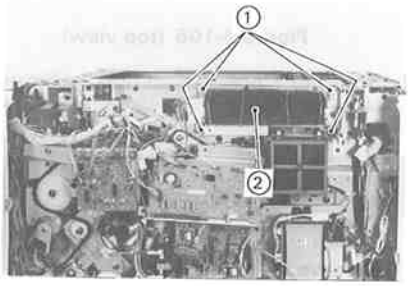
3) Remove the connector (J606), and remove the three mounting screws for the motor driver.



① J606 ③ Mounting screws
② Motor driver

Figure 4-108

4) Remove the four mounting screws, and remove the fan.

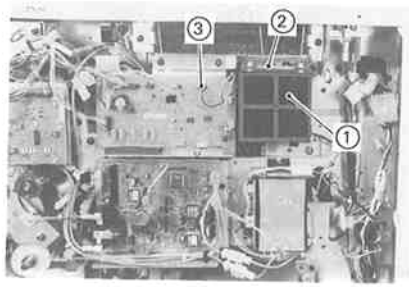


① Mounting screws ② Fan

Figure 4-109

3. Heat Exhaust Fan (FM1; removing the ozone filter)

1) Remove the rear cover.
2) Remove the ozone filter.
3) Remove the heat exhaust fan; three screws, connector J607.



① Ozone filter ③ J607
② Heat exhaust fan

Figure 4-110

4. Feeder Fan (FM3; removing the ozone filter)

See F-1 of II. for removal of the ozone filter; see B-1 of III. for removal of the feeder fan.

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II. DRIVE SYSTEM

A. Lens Drive Unit

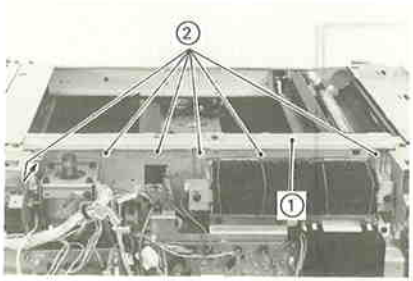
1. Outline

The lens drive unit is used to move the zoom lens by transmitting the rotation of the lens motor (M3) to lens drive cable.

2. Disassembly and Assembly

a. Removing the Lens Motor

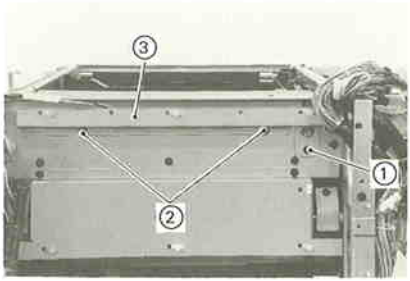
1) Remove the upper and rear covers.
2) Remove the harness retainer; six screws.



① Harness retainer ② Screws

Figure 4-201

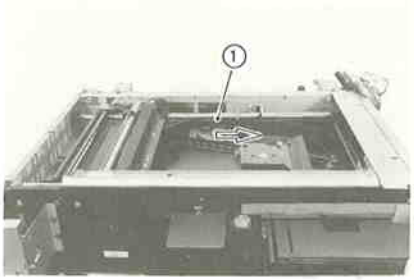
3) Remove the mirror drive cable.
4) Remove the DC controller.
■ The connector may be left as it is.
5) Remove the screw, and remove the scanner rail support plate; remove the two screws, and remove the harness cover.



① Support plate ③ Harness cover
② Screws

Figure 4-202

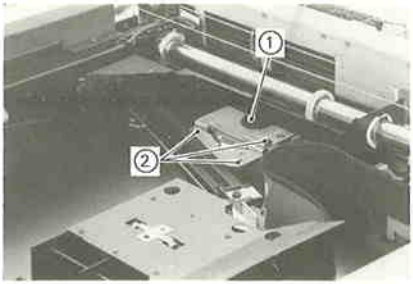
6) Move the scanner rail in the direction of the arrow (Figure 4-203) to free the left side of the rail.



① Scanner rail

Figure 4-203

7) Remove the scanner together with the rail.
8) Remove the three mounting screws, and remove the lens motor.



① Lens motor ② Screws

Figure 4-204

Note:
The scanner is adjusted at the factory with high precision; do not remove parts not found in the PARTS CATALOG.

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b. Fitting the Lens Drive Cable

1) Remove the scanner unit, and fit the lens drive cable in the order shown in Figure 4-205.

Note:
Wind the cable four times around pulley 3; make sure that the end leading to pulley 4 is on top.

2) Pull at a point between the pulley and lens motor with a spring gauge about 10 mm, and slide the pulley into the direction of A so that the reading of the spring gauge is 260 ±50 g; fix the pulley using a screw.

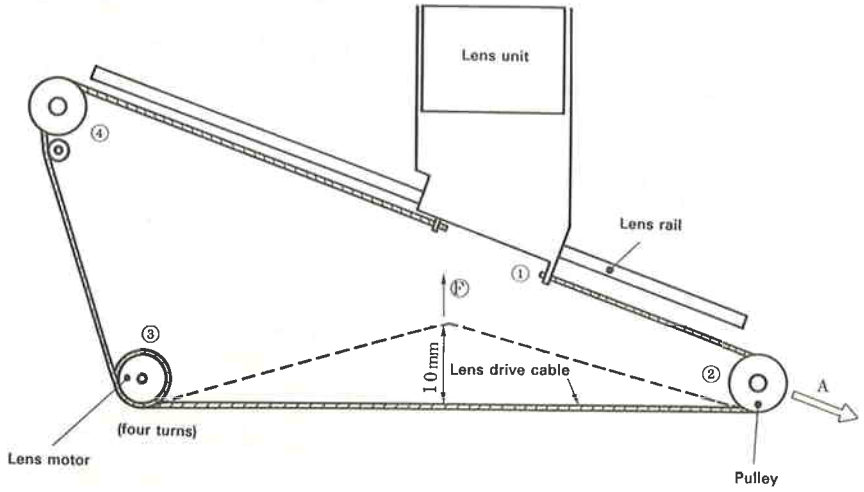

Figure 4-205

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B. Scanner Drive Unit

1. Fitting the Mirror Drive Cable

1) Loosen the two fixing screws shown in Figure 4-206.
2) Turn the adjusting screw to move pulley 3 to the right.
3) Move the mirror 1 mount and mirror 2 mount to the advance direction as far as they go.
4) Fit the cable in the order shown in Figure 4-206.
- Bottom of the pulley at 2.
- From bottom to top clockwise five times at 4.

Note:
Take care so that the cable is not twisted.

- Top of the pulley at 6.

5) Adjust the tension of the cable.
6) Adjust the position of the mirror.

2. Adjusting the Mirror Drive Cable Tension

To adjust the tension of the mirror drive cable, loosen the fixing screw, and turn the adjusting screw to change the position of pulley 3.

Move the mirror 1 mount toward the home position, and measure the tension of the mirror drive cable between 1 and 2 in Figure 4-206. Adjust the tension so that the reading is 800 to 900 g when the cable has a slack of 20 mm toward the front.

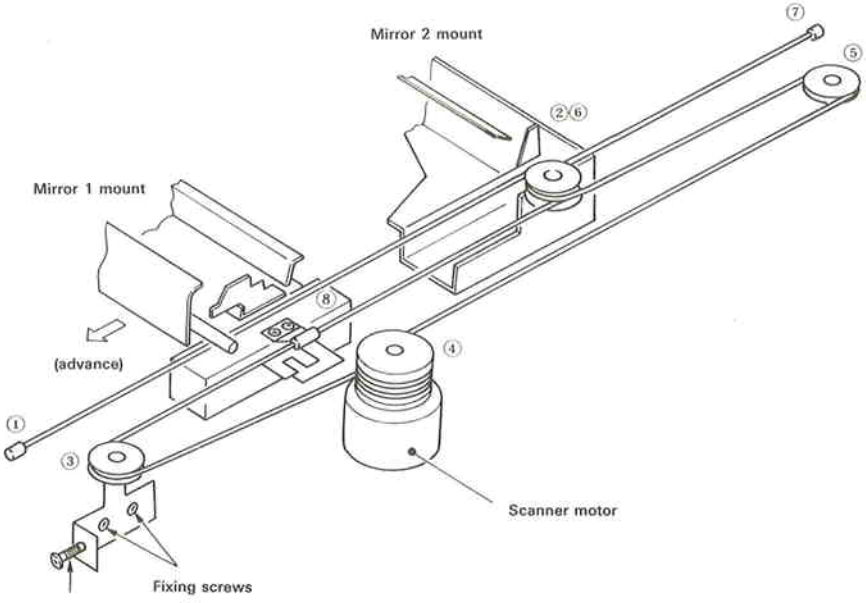

Figure 4-206

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3. Adjusting the Mirror Position (optical length between mirror 1 and mirror 2)

Adjust the position of the mirror when the mirror drive cable has been replaced. To adjust, change the position of the fixing of the mirror 1 mount.

Note:
The cable tends to stretch as copies are processed in large numbers.

1) Use a sheet of copy paper (A4 or A3), and draw lines 1 cm from its sides as shown in Figure 4-207.

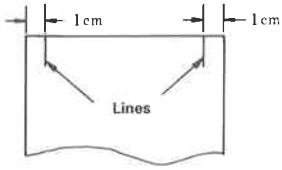

Figure 4-207

2) Use the sheet with marks as a document and make a copy. (A)
3) Place a blank sheet of paper on the copyboard, and feed the sheet with lines in the manual mode. (B)
- The sheet fed will show contraction caused by heat.

4) Align the left line of the sheet copied (A) and that of the sheet fed (B). Adjust the position of the mirror 1 mount so that distances x and y shown in Figure 4-208 are identical.

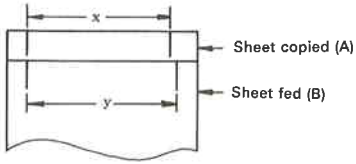

Figure 4-208

x = y Proper
x > y Move the mirror 1 mount in the direction of a.
x < y Move the mirror 1 mount in the direction of b.

Note:
The copy image will be enlarged if the distance between mirror 1 and mirror 2 is short; and reduced, if long.

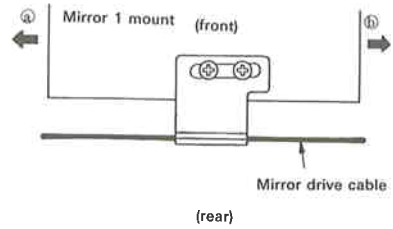

Figure 4-209 Top View

4. Lubrication

After cleaning the scanner rail, apply oil over the rail.

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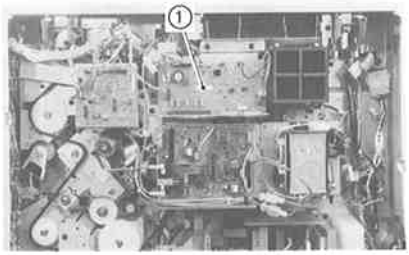
C. Main Motor Unit

1. Removing the Main Motor Unit

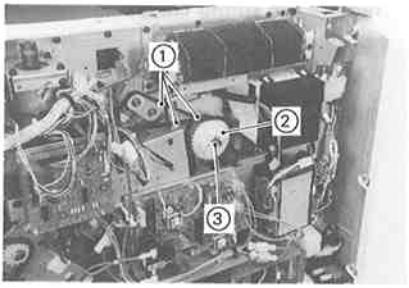
1) Remove the rear cover.
2) Remove the motor driver; eight connectors.



① Motor driver unit

Figure 4-210

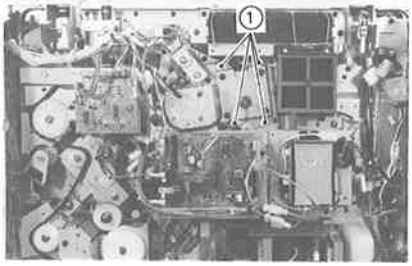
4) Remove the grip ring, and remove the three main motor gears and three chains.



① Chains
② Main motor gear
③ Grip ring

Figure 4-211

5) Remove the four mounting screws, and remove the main motor.



① Mounting screws

Figure 4-212

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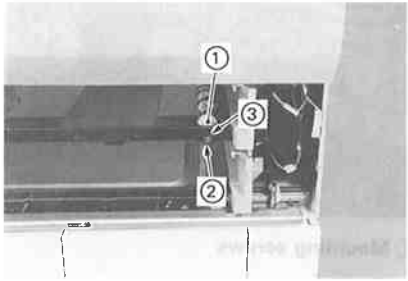
D. Pick-Up Drive Unit

1. Removing the Pick-Up Drive Unit

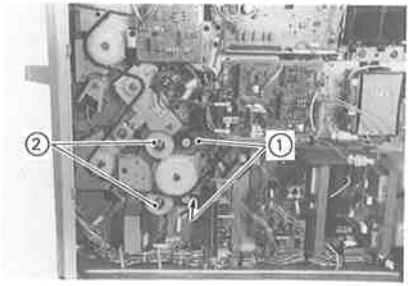
1) Remove the rear cover.
2) Remove the E-ring, bushing, and pick-up roller.



① E-ring
② Bushing
③ Mounting screw for pick-up roller

Figure 4-213

3) Remove the screw, and remove the pick-up drive unit.

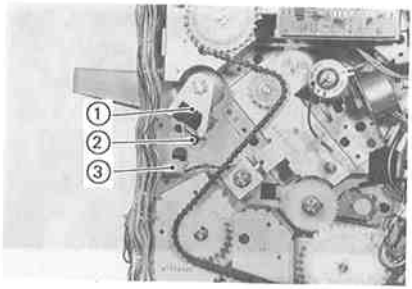


① Screws
② Pick-up drive unit

Figure 4-214

2. Removing the Manual Feed Pick-Up Drive Unit

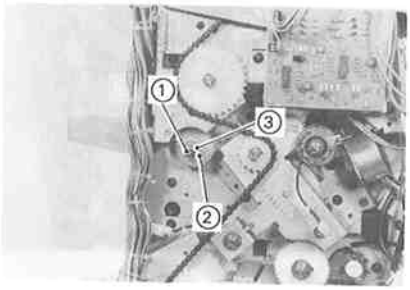
1) Remove the rear cover.
2) Remove the manual feed pick-up solenoid; one screw, one connector.



① Manual feed pick-up solenoid
② Screw
③ Connector

Figure 4-215

3) Remove the E-ring and set screw, and remove the spring clutch.



① E-ring
② Set screw
③ Spring clutch

Figure 4-216

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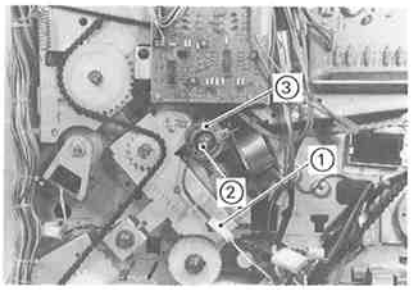
E. Registration Roller Drive Unit

1. Removing the Registration Roller Clutch, Registration Drive Unit, and Side Registration Roller Drive Unit

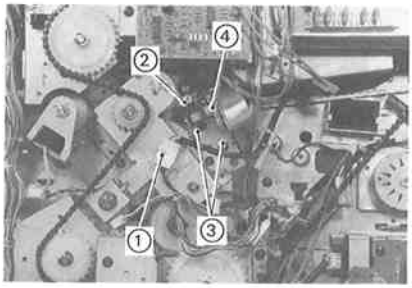
1) Remove the rear cover.
2) Remove the connector (2P) and grip ring, and remove the registration roller clutch (CL1).



① Connector
② Grip ring
③ Registration roller clutch (CL1)

Figure 4-217

3) Remove the connector (6P), E-ring, and two screws, and remove the side drive unit.



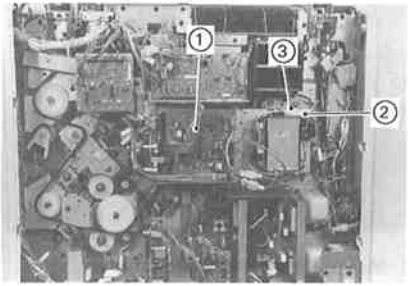
① Connector
② E-ring
③ Mounting screws
④ Side registration drive unit

Figure 4-218

F. Other Drive Units

1. Removing the Set-Back Roller Drive Motor, Fixing Drive Unit, Feeder Filter, and Cleaning Belt Drive Solenoid

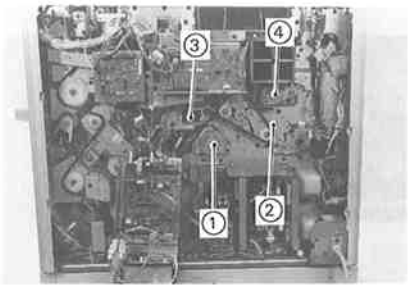
1) Remove the rear cover.
2) Remove the relay mounting screw and connector on the high-voltage transformer, and remove the high-voltage transformer mounting screws; three screws.



① High-voltage transformer
② Relay mounting screw
③ Connector

Figure 4-219

4) Remove those shown in Figure 4-220.



① Set-back roller (2 screws)
② Fixing drive unit (2 screws)
③ Feeder filter (1 screw)
④ Cleaning belt drive solenoid (2 screws)

Figure 4-220

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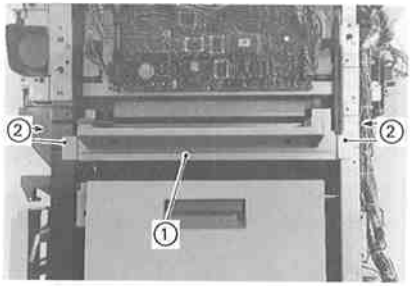
III. FEEDER SYSTEM

A. Pick-Up Unit

1. Removing the Manual Feed Pick-Up Roller and Manual Feed Pick-Up Guide

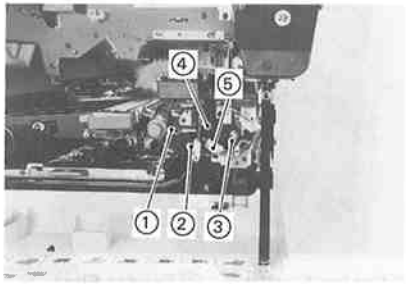
1) Remove the manual feed unit cover.
2) Remove the manual feed unit stay; four screws.



① Manual feed stay ② Screws

Figure 4-300

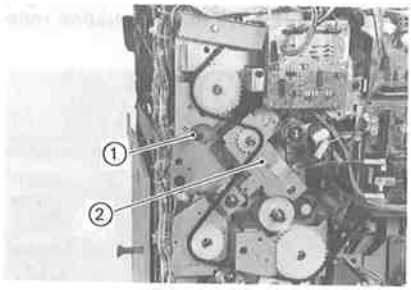
3) Open the front cover, and remove the counter cover; two screws.
4) Remove the screw, and remove bushings 1 and 2; remove the E-ring, and remove bushing 3; and remove the varistor mounting screw and connector.



① Bushing 1
② Bushing 2
③ Bushing 3
④ Varistor mounting screw
⑤ Connector

Figrue 4-301

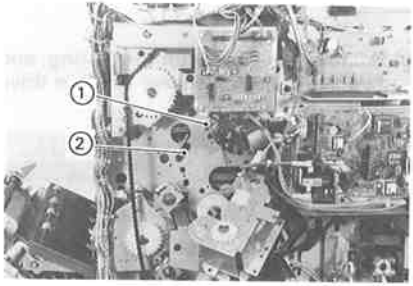
5) Remove the manual feed pick-up drive unit.
6) Remove the two E-rings, remove bushing 4, and remove the main pick-up drive unit; three screws.



① E-ring ② Bushing 4

Figure 4-302

7) Remove bushings 5 and 6; one screw.



① Bushing 5 ② Bushing 6

Figure 4-303

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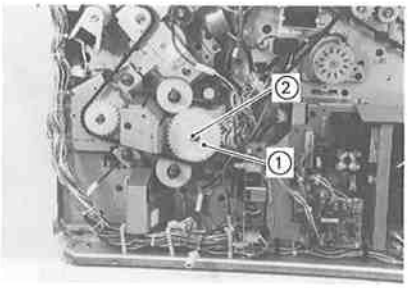
2. Removing the Pick-Up Roller

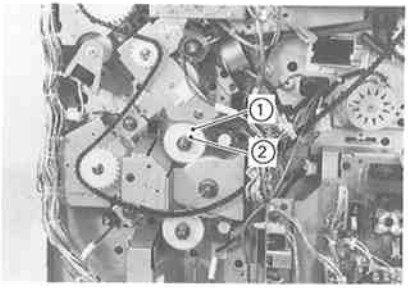
1) Remove the rear cover and lower front cover.
2) Remove gear 1; one E-ring.



① Gear 1 ② E-ring

Figure 4-304

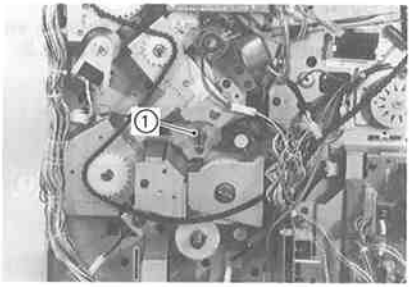
3) Remove gear 2; one set screw.



① Gear 2 ② Set screw

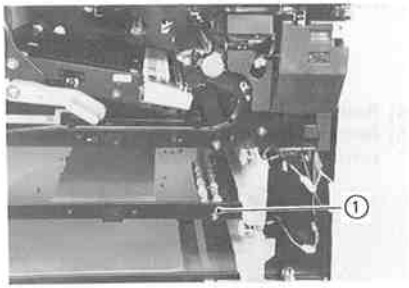
Figure 4-305

4) Remove the E-rings at both ends of the pick-up roller shaft, remove the bushing, and remove the pick-up roller shaft.



① E-ring

Figure 4-306



① E-ring

Figure 4-307

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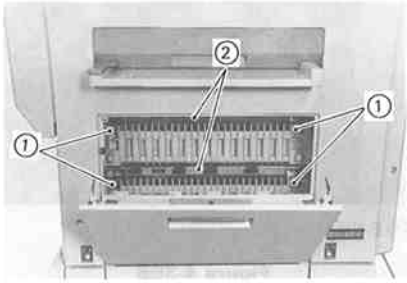
3. Removing Vertical Path Rollers 1 and 2

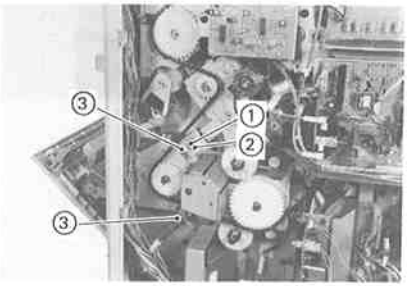
1) Remove the lower front cover.
2) Open the right door.
3) Remove the two mounting screws, and pull out the pick-up guides 1 and 2.



① Mounting screws ② Pick-up guides 1 and 2

Figure 4-308

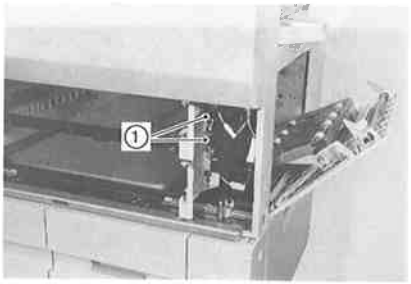
4) Remove the rear cover.
5) Remove the grip ring and set screw, and remove the drive clutch.



① Grip ring ③ Drive clutch
② Set screw

Figure 4-309

6) Remove the E-rings at both ends of the shaft, and remove the vertical path roller.



① E-rings

Figure 4-310

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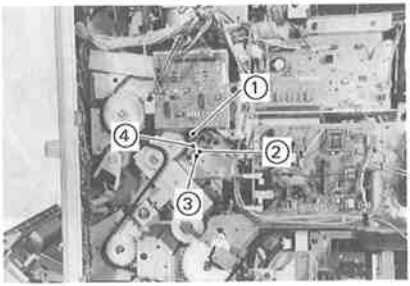
4. Removing the Registration Roller

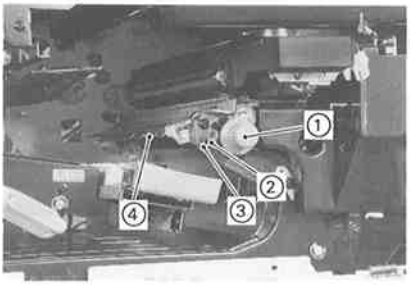
1) Remove the registration roller drive unit.
2) Remove the pressure spring and bushing 1; one screw, one E-ring.



① Pressure spring
② Bushing 1
③ Mounting screw
④ E-ring

Figure 4-311

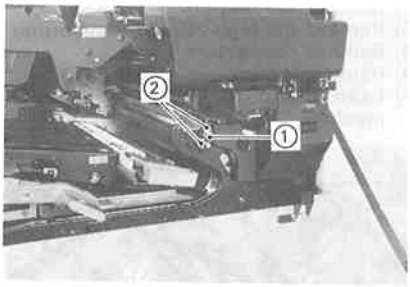
3) Remove the knob, remove the screw and bushing 2, and remove the transfer guide.



① Knob
② Bushing 2
③ Mounting screw
④ Transfer guide

Figure 4-312

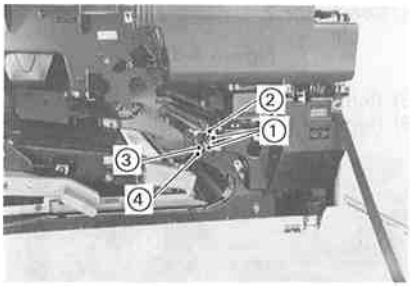
4) Remove bushing 3; two E-rings.



① Bushing 3
② E-rings

Figure 4-313

5) Remove the E-ring, pressure spring, screw and bushing 4, and remove the registration roller.



① E-rings
② Pressure spring
③ Bushing 4
④ Mounting screw

Figure 4-314

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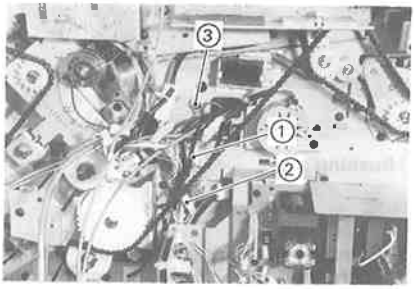
B. Feeder Unit

1. Removing the Feeder Unit

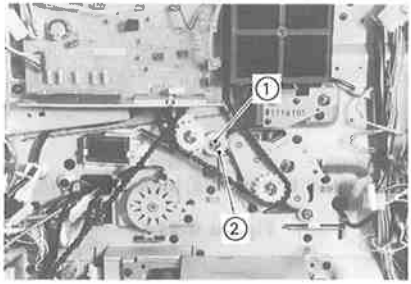
1) Remove the rear cover.
2) Remove the high-voltage transformer.
3) Remove connectors 1 and 2.
4) Remove the grounding wire.
5) Lead the cord inside the copying machine.



① Connector 1 ③ Grounding wire
② Connector 2

Figure 4-315

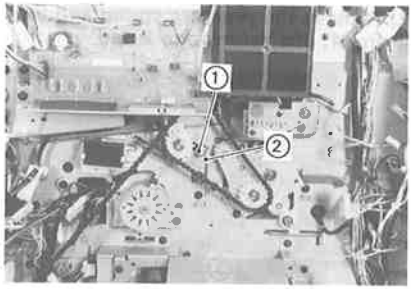
8) Remove the grip ring.
9) Remove the gear.



① Grip ring ② Gear

Figure 4-316

10) Remove the E-ring, and pull out the bushing.



① E-ring ② Bushing

Figure 4-317

11) Open the front door, and remove the drum unit.
12) Remove the E-ring, and pull out the bushing.

① E-ring

Figure 4-318

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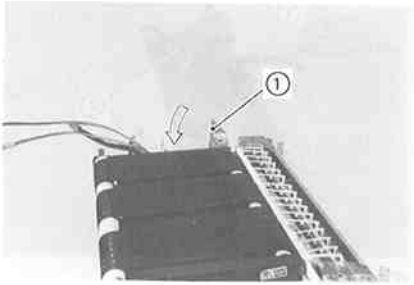
13) Remove the hook at the rear of the feeder unit from the plate at the rear of the drum separation claw unit. (Release the hook into the direction of the arrow.)



① Hook

Figure 4-319

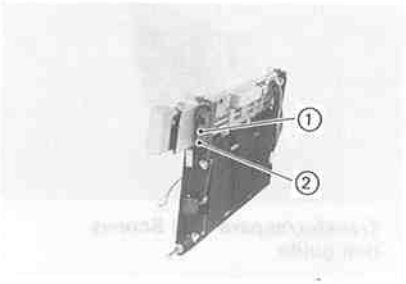
① Plate

Figure 4-320

14) Lift the front of the feeder unit, and pull it out to the front of the copying machine with care.

2. Detaching the Feeder Belt

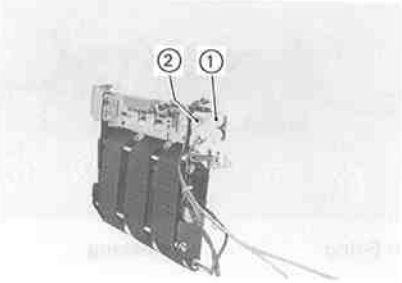
1) Remove the feeder unit from the copying machine.
2) Remove the screw and cleaner, and remove the corona assembly.



① Screw ② Cleaner

Figure 4-321

3) Remove the transfer/separation electrode; one screw.



① Electrode ② Screw

Figure 4-322

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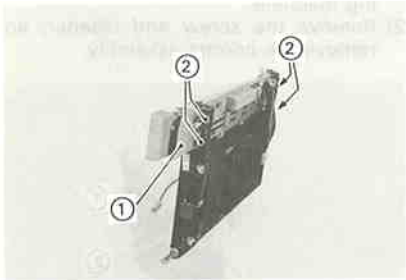
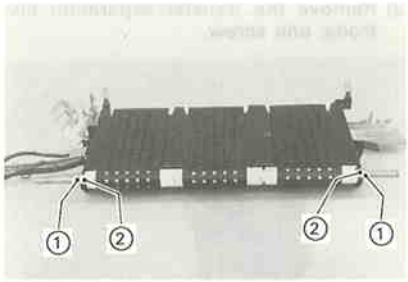
4) Remove the four screws, and remove the transfer/separation guide.



① Transfer/separation guide ② Screws

Figure 4-323

5) Remove the E-ring and bushing, and remove the feeder roller.

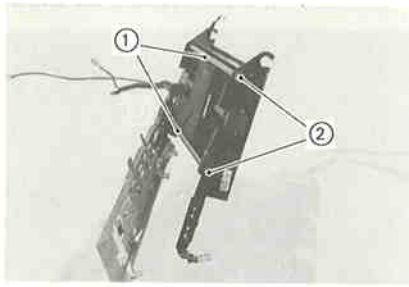


① E-ring ② Bushing

Figure 4-324

Note:
When mounting the feeder roller, take note of its orientation.

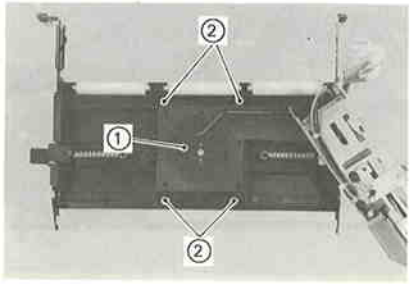
6) Remove the feeder belt.
7) Remove the two shafts with an E-ring each.



① Shafts ② E-rings

Figure 4-325

8) Remove the feeder fan; four screws.



① Feeder fan ② Screws

Figure 3-326

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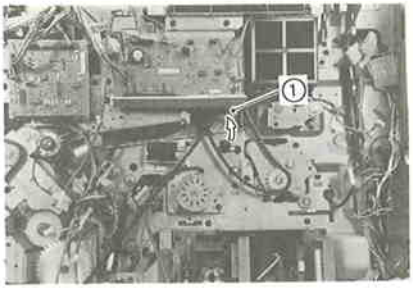
Note:
Keep the gear shown in Figure 4-327 out of the way when mounting the feeder unit.



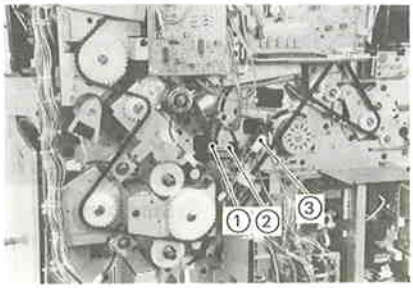
① Gear

Figure 4-327

C. Lower Feeder Unit

1. Removing the Lower Feeder Unit

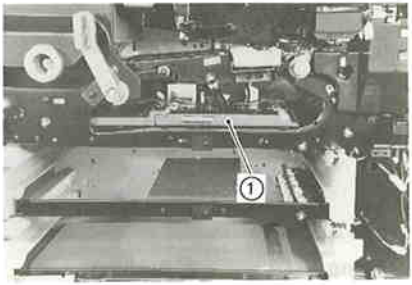
1) Remove the rear cover.
2) Remove the high-voltage transformer.
3) Remove the set-back roller drive motor.
4) Remove the resin box, and pull out the pin.
5) Remove the connector



① Resin box
② Pin
③ Connector

Figure 4-328

6) Pull out the lower feeder unit upper guide.
7) Remove the front door.
8) Pull out cassettes 1 and 2.
9) Remove the lower front cover.
10) Remove pick-up roller 1.



① Lower feeder unit upper guide

Figure 4-329

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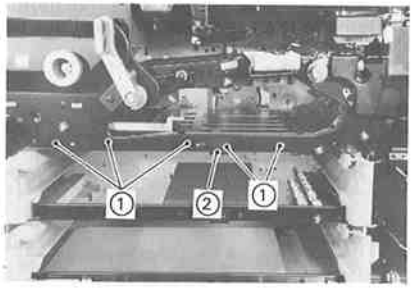
11) Remove the five screws and stop plate, and pull out the lower feeder unit lower guide.



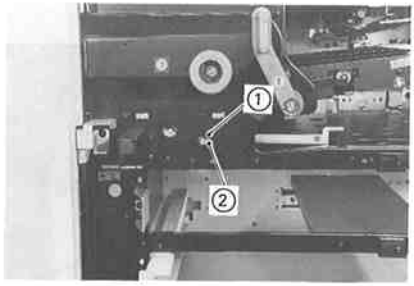
① Screws ② Stop plate

Figure 4-330

12) Remove the E-ring and bushing, and remove the set-back roller and lower feeder outlet roller.

2. Removing the Lower Feeder Unit Inlet Roller

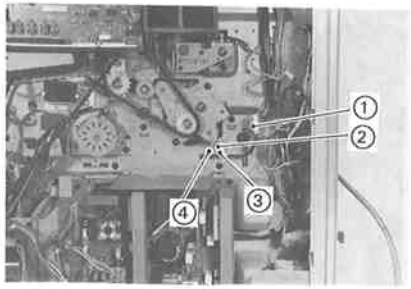
1) Open the front door.
2) Remove the E-ring, and pull out the bushing.



① E-ring ② Bushing

Figure 4-331

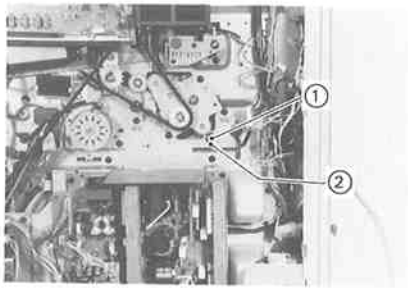
3) Remove the rear cover.
4) Remove the high-voltage transformer.
5) Pull out the connector.
6) Remove the grip ring, and pull out the gear.



① Connector ③ Grip ring
② Lower feeder unit inlet roller shaft ④ Gear

Figure 4-332

7) Remove the E-ring, and pull out the bushing.



① E-ring ② Bushing

Figure 4-333

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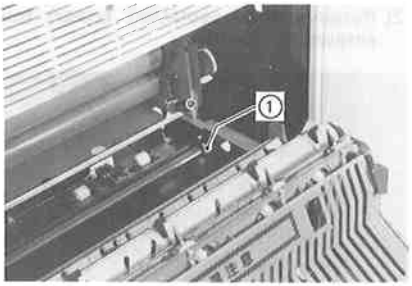
8) Open the delivery unit, and remove the spring.



① Spring

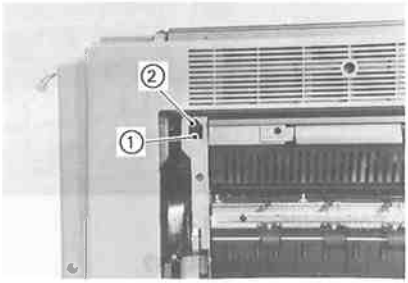
Figure 4-334

9) Pull out the lower feeder unit inlet guide through the front, and pull out the roller.

D. Delivery Unit

1. Removing the Delivery Unit

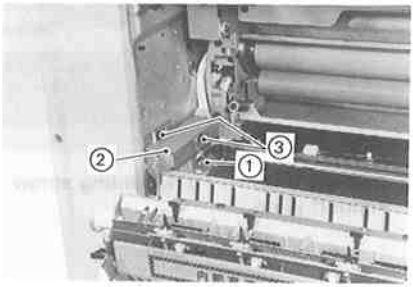
1) Remove the delivery cover; two screws.
2) Remove the screw from the delivery unit support tape.



① Support tape ② Screw

Figure 4-335

3) Open the delivery unit, and remove the grounding wire; one screw.
4) Remove the connector cover; one screw.



① Grounding wire ③ Mounting screw
② Connector cover

Figure 4-336

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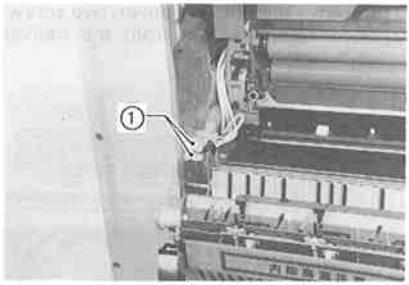
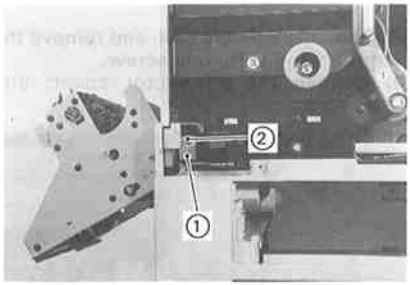
5) Remove the two connectors.



① Connectors

Figure 4-337

6) Remove the support plate, and remove the delivery unit.

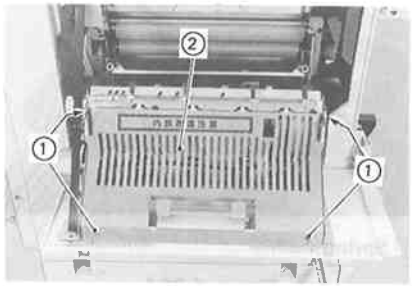


① Delivery unit support plate ② Mounting screw

Figure 4-338

2. Removing the Upper Separation Claw

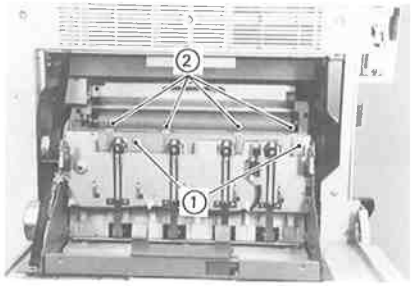
1) Open the delivery unit.
2) Remove the insulation cover; four screws.



① Screws ② Insulation cover

Figure 4-339

4) Remove the two screws, and remove the upper separation claw.



① Screws ② Upper separation claws

Figure 4-340

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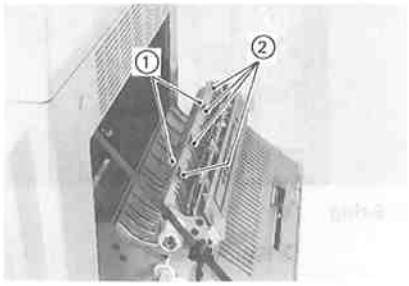
3. Removing the Lower Separation Claw

1) Open the delivery unit.
2) Remove the two screws, and remove the lower separation claw.



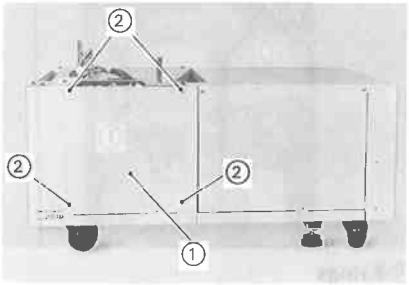
① Screws ② Lower separation claws

Figure 4-341

E. Cassette Feeding Unit

1. Upper Pick-Up Roller

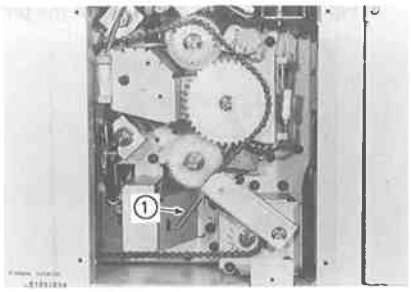
1) Remove the cassette feeding unit rear cover (left).



① Rear cover (left) ② Mounting screws

Figure 4-342

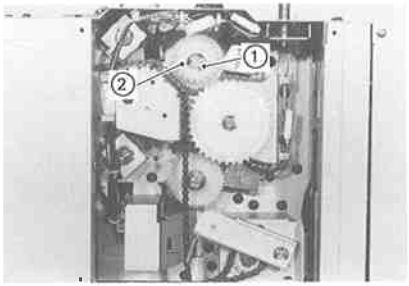
2) Remove the spring.



① Spring

Figure 4-343

3) Remove the E-ring, and remove the gear.



① E-ring ② Gear

Figure 4-344

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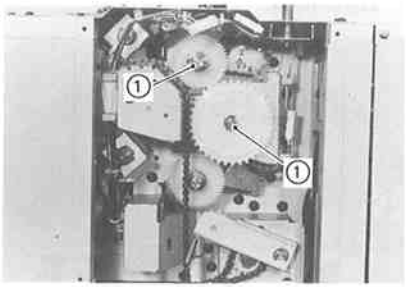
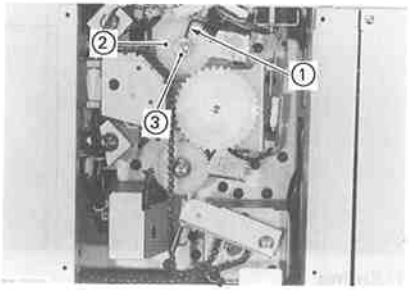
4) Remove the two E-rings shown in Figure 4-345.



① E-rings

Figure 4-345

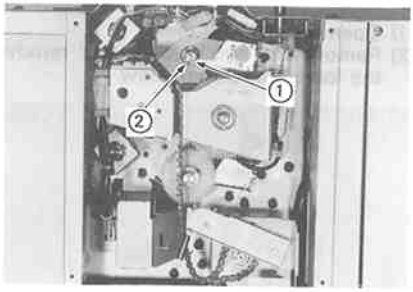
5) Loosen the screw with a hex wrench, remove the ring, and remove the gear with a spring clutch and the gear shown in Figure 4-346; be careful with the pin.



① Hex wrench
② Gear with spring clutch
③ Ring

Figure 4-346

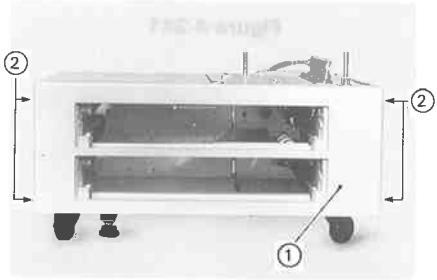
6) Remove the E-ring and bushing.



① E-ring ② Bushing

Figure 4-347

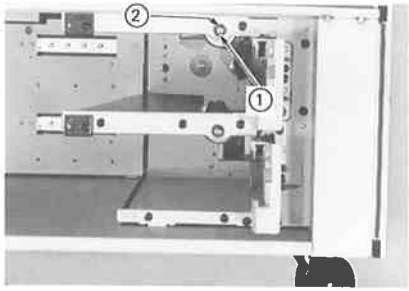
7) Remove the cassette feeding unit front cover.



① Front cover ② Mounting screws

Figure 4-348

8) Remove the E-ring and bushing, and remove the upper pick-up roller together with the shaft.



① E-ring ② Bushing

Figure 4-349

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9) Remove the mounting screw, and remove the pick-up roller.

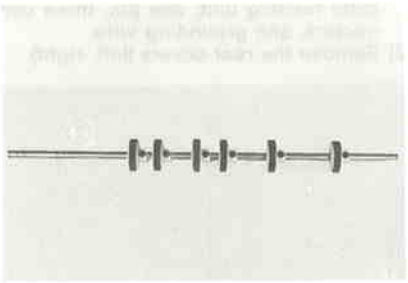
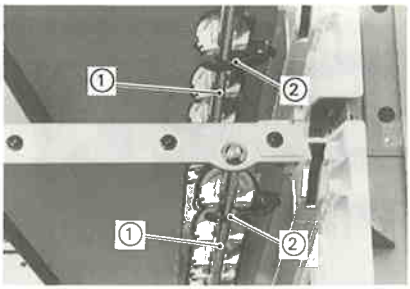


Figure 4-350

Note:
Mount the pick-up roller shaft in such a manner that the arm of the cassette paper sensor is as shown in Figure 4-351.

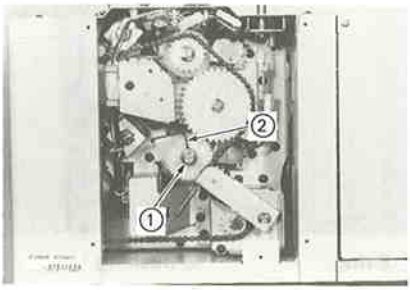


① Pick-up roller shaft ② Sensor arm

Figure 4-351

2. Lower Pick-Up Roller

1) Remove the ring shown in Figure 4-352 using a hex wrench.



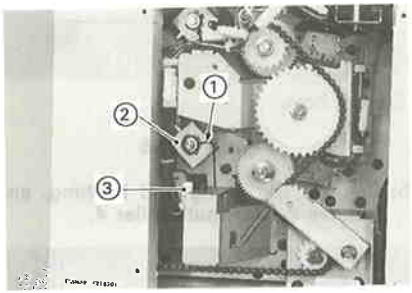
① Ring ② Hex wrench

Figure 4-352

2) Perform the steps given for the upper pick-up roller.

3. Vertical Path Roller 4

1) Remove the rear cover (left) of the cassette feeding unit; see Figure 4-619.
2) Remove the connector (2P) shown in Figure 4-353, loosen the screw with a hex wrench, and remove the clutch.



① Hex wrench ③ Connector (2P)
② Clutch

Figure 4-353

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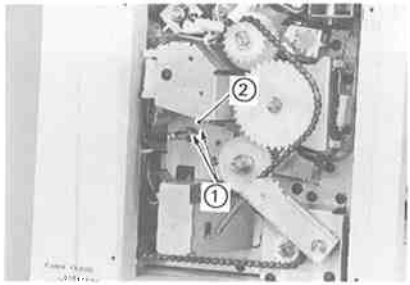
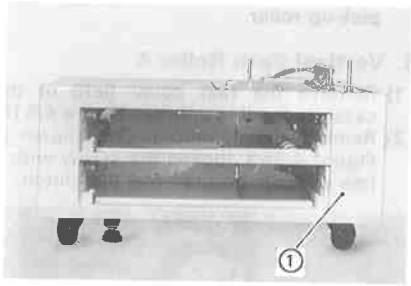
3) Remove the two E-rings and bushing.



① E-ring ② Bushing

Figure 4-354

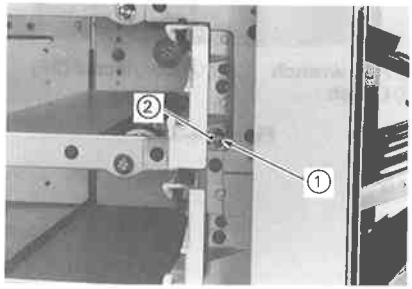
4) Remove the cassette feeding unit front cover.



① Front cover

Figure 4-355

5) Remove the E-ring and bushing, and remove vertical path roller 4.

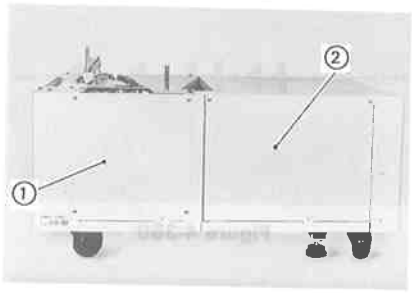


① E-ring ② Bushing

Figure 356

4. Vertical Path Roller 3

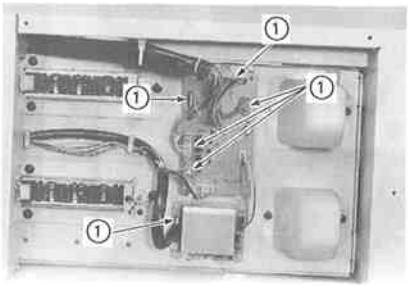
1) Lift the copying machine off the cassette feeding unit; one pin, three connectors, one grounding wire.
2) Remove the rear covers (left, right).



① Rear cover (left) ② Rear cover (right)

Figure 4-357

3) Remove the connectors shown in Figure 4-358.



① Connectors

Figure 4-358

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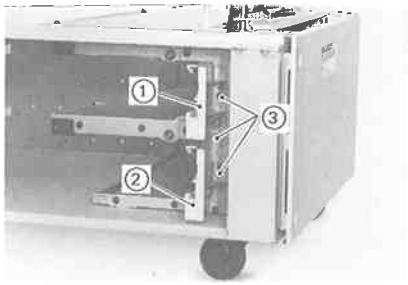
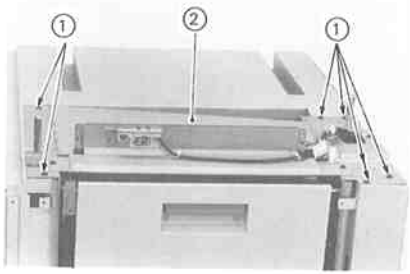
4) Remove the front cover.
5) Remove the front section of the upper and lower cassette rails.



① Upper cassette rail front section
② Lower cassette rail front section
③ Mounting screws

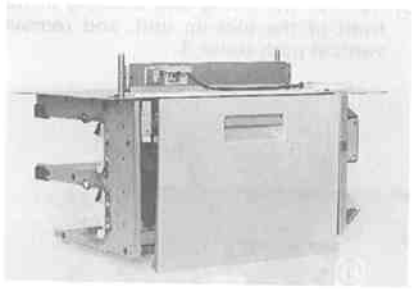
Figure 4-359

6) Remove the six mounting screws, and remove the pick-up unit from the cassette feeding unit.



① Mounting screws ② Pick-up unit

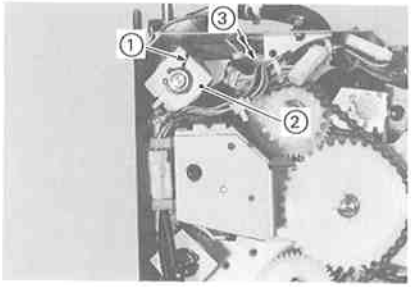
Figure 4-360



① Pick-up unit

Figure 4-361

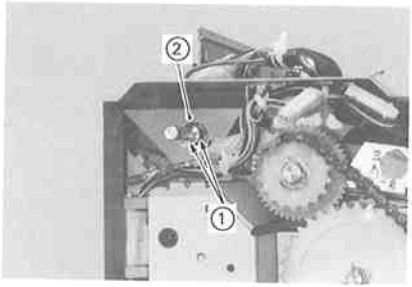
7) Loosen the screw with a hex wrench, remove the connector, and remove the clutch.



① Hex wrench
② Clutch
③ Connector

Figure 4-362

8) Remove the two E-rings, and remove the bushing.



① E-rings ② Bushing

Figure 4-363

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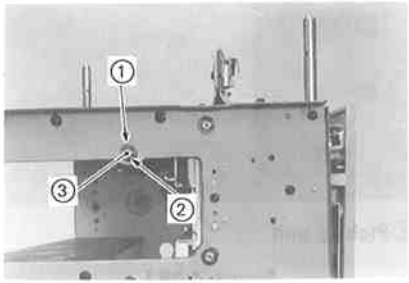
9) Remove the E-ring and bushing in the front of the pick-up unit, and remove vertical path roller 3.



① E-ring
② Bushing
③ Vertical path roller shaft

Figure 4-364

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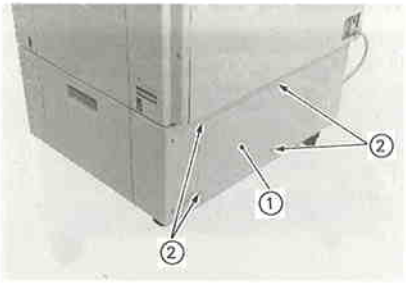
F. Paper Deck

1. Feed Roller

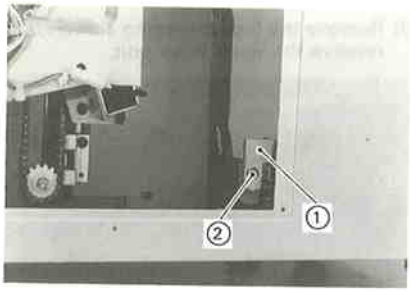
1) Remove the rear cover from the paper deck.



① Rear cover ② Mounting screws

Figure 4-365

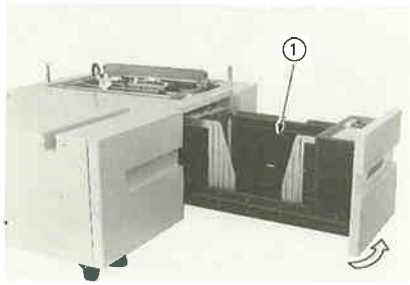
2) Remove the deck stopper plate.



① Deck stopper plate ② Mounting screw

Figure 4-366

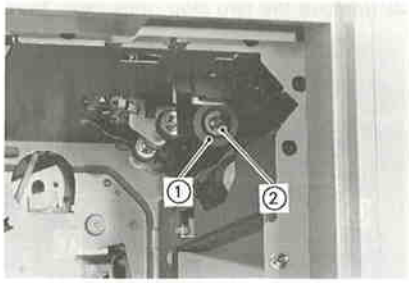
3) Remove the deck.



① Deck

Figure 4-367

4) Remove the stop ring, and remove the feed roller.



① Stop ring ② Feed roller

Figure 4-368

Note:
The feed roller has its own orientation; mount it so that it is as shown in Figure 4-369.

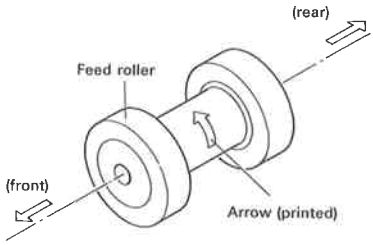


Figure 4-369

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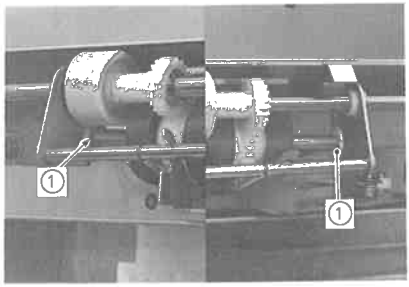
2. Separation Roller

1) Open the side door.
2) Remove the two stop rings (rear, front).



(front)
① Stop ring

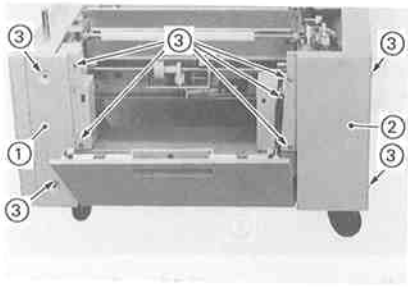
(rear)
① Stop ring

Figure 4-370

3) Remove the separation roller together with its shaft.

3. Pick-Up Roller

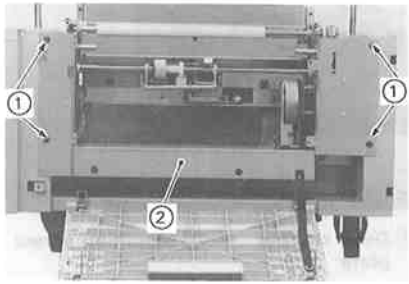
1) Lift the copying machine off the paper deck, and remove the deck.
2) Remove the side covers (front, rear).



① Side cover (front) ③ Mounting screws
② Side cover (rear)

Figure 4-371

3) Remove the four mounting screws, and remove the deck drive unit.



① Mounting screws ② Deck drive unit

Figure 4-372

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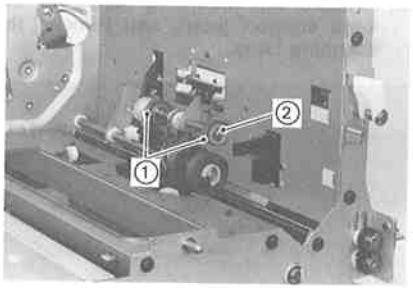
4) Remove the E-ring, and remove the pick-up roller.

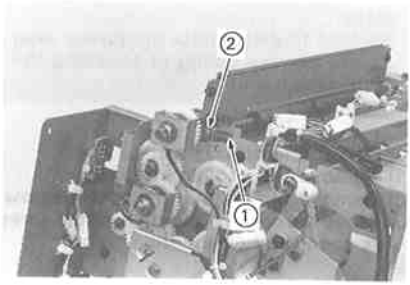


① Pick-up roller ② E-ring

Figure 4-373

3. Registration Roller

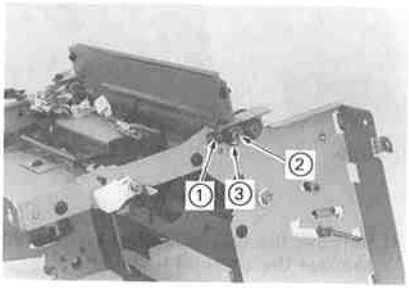
1) Remove the deck drive unit; see p. 4-30.
2) Remove the spring and E-ring.



① Spring ② E-ring

Figure 4-374

3) Remove the spring, E-ring, and gear on the opposite side.



① Spring ③ Gear
② E-ring

Figure 4-375

4) Remove the registration roller.

4. Paper Deck Controller PCB

The paper deck controller PCB is located at the bottom of the paper deck drive unit. To remove the controller PCB, simply remove the paper deck drive unit.

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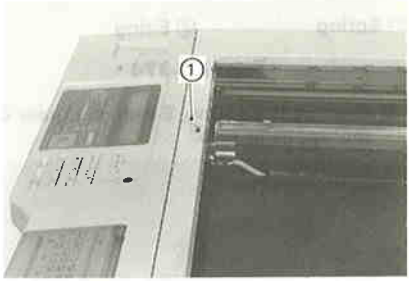
IV. EXPOSURE SYSTEM

A. Illumination Unit

Note:
Be sure to disconnect the power plug before disassembling or checking the illumination unit.

1. Removing the Thermal Fuse

1) Remove the copyboard glass.
2) Remove the magnet plate; one screw.
3) Move the mirror 1 mount until the screw is seen through the hole.



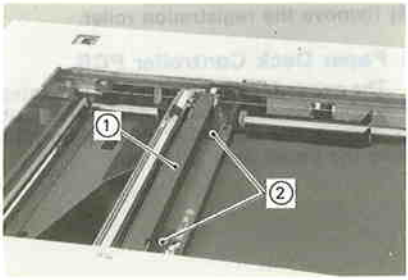
① Hole

Figure 4-400

4) Remove the two mounting screws, and remove the thermal fuse.

2. Removing the Scanning Lamp

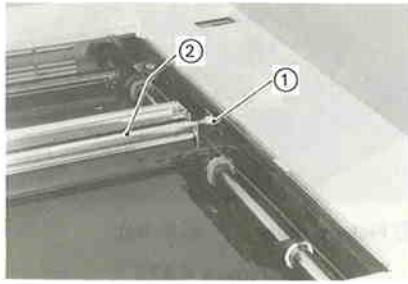
1) Remove the copyboard glass.
2) Remove the upper reflector; two screws.



① Upper reflector ② Screws

Figure 4-401

3) Remove the mounting screw of the lamp support (rear), and remove the scanning lamp.



① Lamp support (rear) ② Scanning lamp

Figure 4-402

Note:
1. Wait until the scanning lamp has cooled.
2. Do not leave fingerprints on the scanning lamp.
3. Dry wipe the scanning lamp if dirty.

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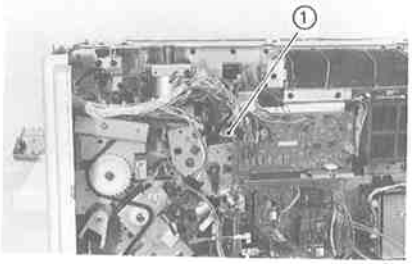
B. Pre-Exposure Lamp Unit

1. Removing the Pre-Exposure Lamp

1) Remove the rear cover.
2) Remove the adjusting PCB.
3) Remove the mounting screw and connector.
4) Pull out the pre-exposure lamp.



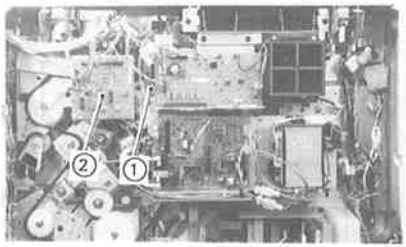
① Pre-exposure lamp

Figure 4-403

C. Blank Exposure Lamp Unit

1. Removing the Blank Exposure Lamp

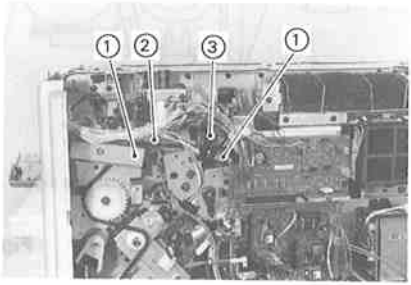
1) Remove the drum unit.
2) Remove the rear cover.
3) Remove the screw, and remove the stop spring; remove the two screws, and remove the adjusting PCB.



① Stop spring ② Adjusting PCB

Figure 4-404

4) Detach the cable from the tension gear, and pull out the blank exposure lamp.



① Tension gears
② Chain
③ Blank exposure lamp

Figure 4-405

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V. CHARGING SYSTEM

A. Drum Unit

1. Outline

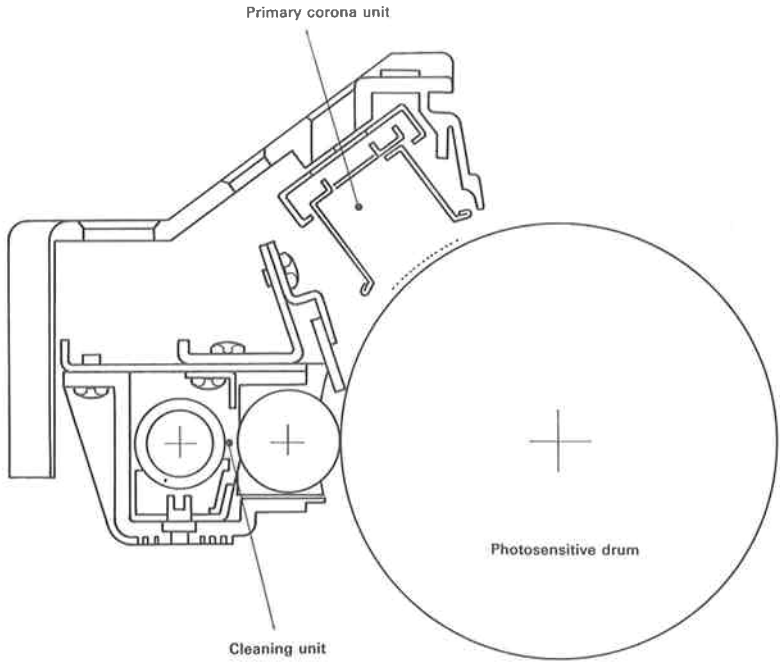

Figure 4-500

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2. Removing the Drum Unit

1) Remove the CD unit.
2) Open the front door.
3) Insert the door switch actuator into the door switch; wait until the warm-up is complete.
4) Enter the service mode, and disengage the black developing assembly.
5) Pull out the door switch actuator.
6) Shift the feeder unit release lever.
7) Open the hopper unit.
8) Remove the screw, and pull out the drum unit.

Note:
The drum is susceptible to light; exposure even to room light may result in white or black spots and lines. Put the light-blocking sheet (or fresh copy paper) around the drum as soon as it is removed from the copying machine, and put it in a dark place.

Note:
1. The drum separation claw is released automatically; do not touch the drum separation claw when setting the drum unit.
2. Check that the drum separation claw is in contact with the drum after setting the drum unit and feeder unit.

3. Cleaning

If the drum is dirty, wipe it with a flannel cloth (no paper, lint-free or otherwise) coated with toner.

Note:
Do not dry wipe or wipe the drum with solvents; never use drum cleaning powder.

4. Replacement

Record the date and counter reading on the label shown in Figure 4-501 upon each replacement of the drum; attach the label on the front cover of the new drum unit.

日付 date date Datum	カウンター counter compteur Zähler	備考 notes note Notiz

Figure 4-501

5. Waste Toner

a. Outline

The waste toner collected by the cleaning unit is kept inside the drum. When the drum becomes full of waste toner, the copying machine indicates on its message display the message WASTE TONER FULL.

Replace the drum unit when the message is indicated.

Note:
Copies may still be made after the message is indicated; however, with an additional 1000 copies or so, the waste toner starts to fall into the feeder unit.

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B. Corona Units

1. Outline

The drum is surrounded by the primary, pre-transfer, and transfer/separation corona units.

The primary corona unit has a grid of 16 wires which are 0.1 mm in diameter and not gold-plated.

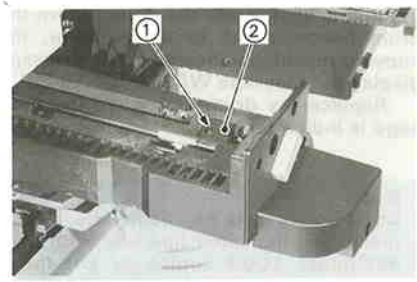
Other units use a gold-plated corona wire 0.06 mm in diameter.

Although the grid wire is not gold-plated, gold-plated wire may be substituted in the field.

2. Disassembly and Assembly

a. Removing the Primary Corona Unit

1) Pull out the drum unit.
2) Remove the screw, and remove the wire cleaner.



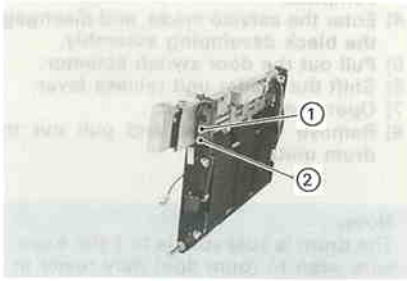
① Screw ② Wire cleaner

Figure 4-502

3) Pull out the primary corona unit.

b. Removing the Transfer/Separation Corona Unit

1) Open the front door.
2) Remove the screw, and remove the wire cleaner.



① Screw ② Wire cleaner

Figure 4-503

3) Release the feeder unit.
4) Pull out the transfer/separation corona unit.

Note:
When mounting the wire cleaner, be sure that the corona wire is in between the pads of the wire cleaner. Further, make copies to check the image after mounting the drum unit.

c. Fitting the Priamry, Pre-Transfer, Transfer, and Separation Corona Wires

1) Remove the shield plate if for the primary corona unit; one screw.
   Open the shield plate, and remove the paper guide if for the separation corona unit; one screw.
2) Move the two covers of the corona unit to the end to remove.
3) Free a length of about 4 mm from the corona wire reel (0.06-mm dia.), and form a loop about 2 mm in diameter at the end.

Note:
To form the loop, wind the corona wire around a hex key once, turn the hex key three to four times, and twist the corona wire.

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4) Cut the end of the corona wire (excess) to 1 mm or less with a nipper.
5) Hook the loop of the corona wire as shown in Figure 4-504, and lead the corona wire along the groove of the height adjusting roller.
Hook the corona wire tension spring on the corona wire, and twist the spring three to four times at the location shown in Figure 4-504.

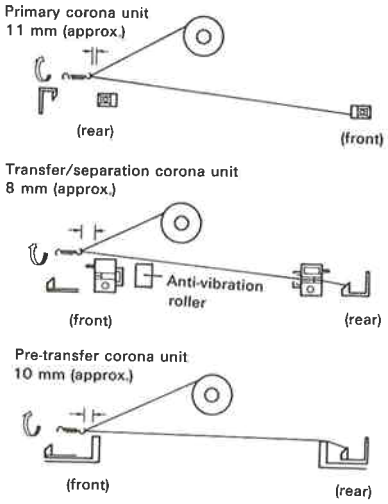

Figure 4-504

6) Cut the excess corona wire to 1 mm or less with a nipper.
7) Pick the end of the corona wire tension spring with tweezers, and hook it on the corona electrode.

Note:
Check the following:
- The corona wire is free of bends or twists and its gold plating has not peeled.
- The corona wire is free of slacks.
- The corona wire is along the groove of the height adjusting roller.
- The gut wire of the transfer/separation corona unit is along the groove.

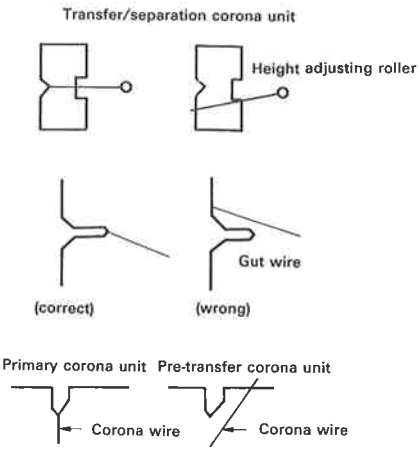

Figure 4-505

Note:
Do not pull on the gut wire excessively; after fitting it, measure the opening width of the corona unit to make sure that the width at the center is not narrower than both ends by 0.5 mm or more.

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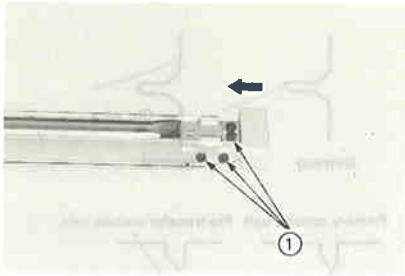
d. Fitting the Grid Wire for the Primary Corona Unit

1) Loosen the three screws holding the block (front), move the block (front) in the direction of the arrow (Figure 4-506), and fix it temporarily in place.



① Mounting screws

Figure 4-506

Note:
To form the loop, wind the corona wire around a hex key once, turn the hex key four to five times, and twist the corona wire.

2) Free a length of corona wire from the corona wire reel (0.1 mm dia.), and form a loop about 2 mm in diameter at its end.
3) Cut the end of the corona wire (excess) to 1 mm or less with a nipper.
4) Hook the loop on the stud shown in Figure 4-507, and fit it in the order shown.
5) Wind the end of the corona wire on the fixing screw, and fix it in place.
6) Cut the excess corona wire to 1 mm or less with a nipper.
7) Loosen the screw temporarily fixed in step 1) once again, move the block into the opposite direction of the arrow (Figure 4-506), and adjust the grid tension.
8) Dry wipe the grid wire.
9) Check the following:

- The grid wire is free of breaks or bends and its gold-plating has not peeled.
- The wire is fit at equal intervals and is along the groove of the block.

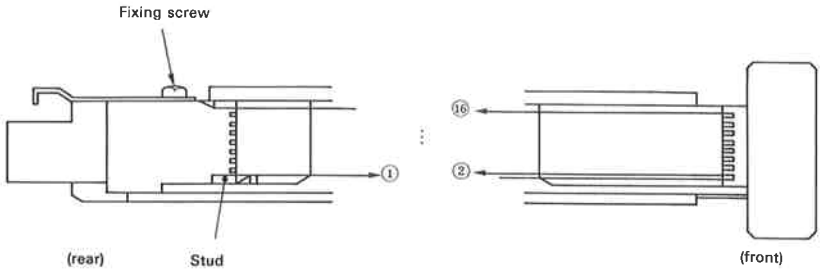


Figure 4-507

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3. Adjusting the Height of the Corona Wire

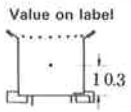
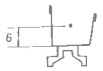
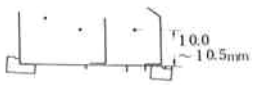
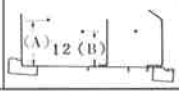
Corona unit	Standard position	Variable
Primary	Value on label 	±3 mm
Pre-transfer		–
Transfer	Value on label 	
Separation	Value on label 	A: $^{+1}_{-2}$ mm B: ±2 mm

Figure 4-508

a. The height (position) of each corona wire can be adjusted by turning the screw behind the corona unit. A full turn on the screw moves the position of the corona wire by about 0.7 mm.
b. The values shown in Figure 4-508 are standard values; each copy machine is adjusted at the factory, and the value at the time is recorded on the label attached on the drum unit. Use the value on the label when making adjustments.

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C. Separation Claw Unit

1. Construction

The separation claw is designed to move back and forth over a length of 16 mm along the drum; the claw makes a single round-trip for each 75 sheets of A4 paper (approx).

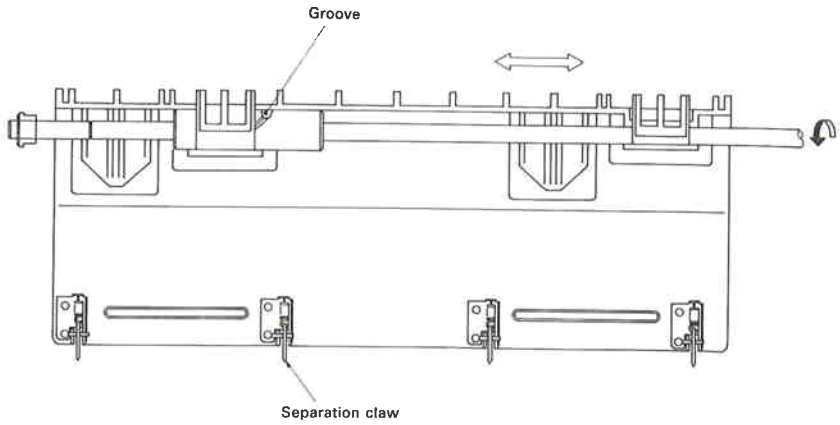
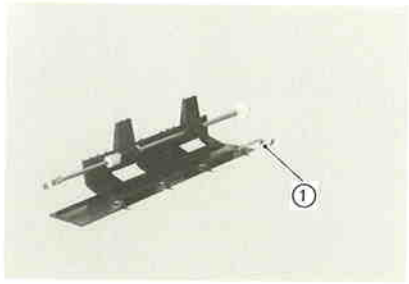


Figure 4-509

2. Removing the Separation Claw Unit

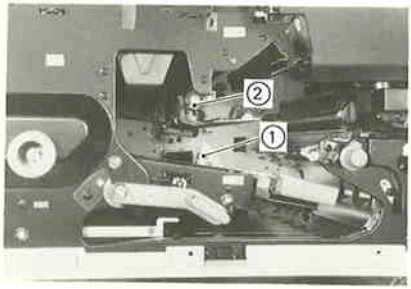
1) Open the front door.
2) Remove the drum unit.
3) Free the plate of the separation claw unit from the hook of the feeder unit.



① Separation claw unit plate

Figure 4-510

4) Push the bushing to the rear, and remove the separation claw unit.



① Hook ② Bushing

Figure 4-511

Note:
- Take care so that the edge of the separation claw will not come into contact with the belt.
- Take care not to damage the separation claw after removal.
- Make sure that the plate of the separation claw is on the hook of the feeder unit after mounting.

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VI. DEVELOPING SYSTEM

A. Black Developing Assembly

1. Construction

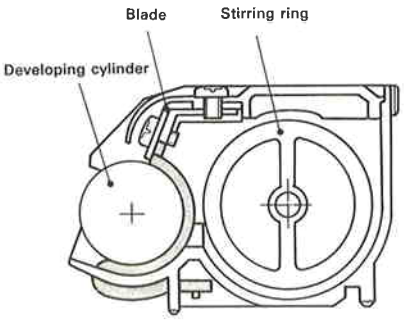
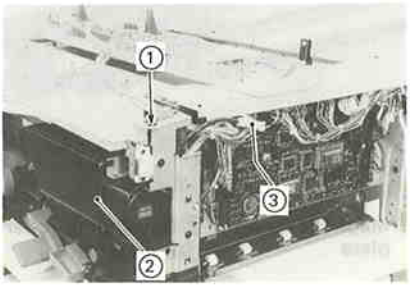


Figure 4-600

2. Removing the Hopper

1) Open the front door.
2) Remove the control panel and right cover.
3) Remove the connector (2P).
4) Remove the fixing screw (Philips).
5) Lift the hopper, and tilt its top toward the front to remove.



① Connector
② Hopper
③ Mounting screw (Philips)

Figure 4-601

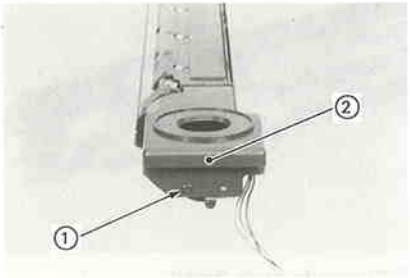
3. Removing the Black Developing Assembly

1) Release the black developing assembly if it is engaged.
2) Shift the feeder unit release lever.
3) Remove the connector (3P) from the black developing assembly, and remove the screw.
4) Pull out the black developing assembly toward the front, and lift its bottom to remove.

Note:
Do not hold the developing assembly from both sides, or toner may cake up.

4. Removing the Blade and Developing Cylinder

1) Remove the developing assembly from the copying machine.
2) Remove the self-tapping screw, and remove the grip.



① Self-tapping screw
② Grip

Figure 4-602

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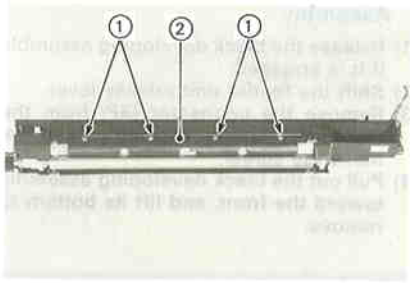
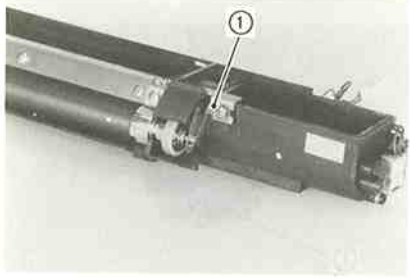
3) Remove the four non-magnetic screws, and remove the developing lid.



① Non-magnetic screws ② Developing lid

Figure 4-603

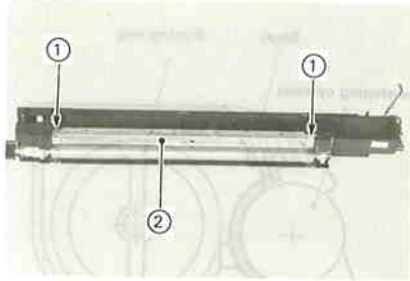
4) Pour the toner out on waste paper (newspaper).
5) Remove the electrode plate (front); one screw.



① Electrode plate (front)

Figure 4-604

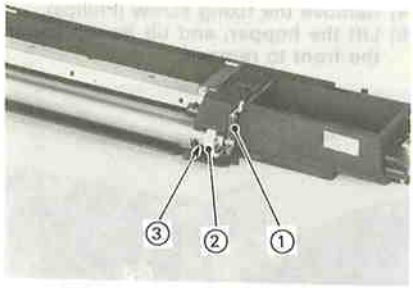
6) Remove the two non-magnetic screws, and remove the blade together with the mounting plate.



① Non-magnetic screws ② Blade

Figure 4-605

7) Remove the magnetic fixing plate; one self-tapping screw.
8) Remove the grip ring, and remove the developing roller and ball bearing.



① Magnetic fixing plate ② Developing roller ③ Ball bearing

Figure 4-606

9) Remove the grip ring, and remove gear A.
10) Remove the gear unit; two non-magnetic screws.
11) Remove gear B, and remove the developing roller.

Note:
Take care not to drop the pin.

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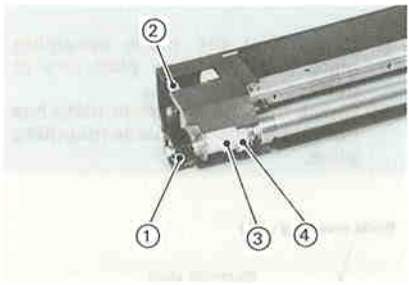
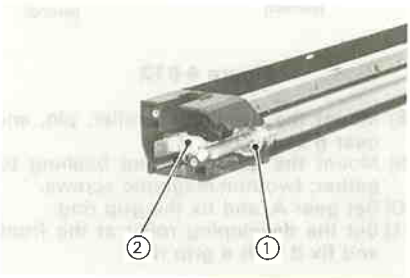


① Gear A
② Gear unit
③ Gear B (w/ pin)
④ Developing roller

Figure 4-607

13) Remove the self-tapping screw, and remove the electrode plate (rear) together with the ball bearing.



① Ball bearing
② Electrode plate (rear)

Figure 4-608

14) Remove the developing cylinder.

5. Mounting the Developing Cylinder and Blade

1) Mount the developing cylinder.

Note:
1. The developing cylinder has its own orientation; the longer of the shaft is to the rear.
2. Do not leave fingerprints or oils on the developing cylinder; if any, use lint-free paper to remove.

2) Insert the electrode plate together with the ball bearing toward the rear.

Note:
3. Do not fit the screw used to hold the electrode plate.
4. Turn the electrode plate into the direction of the arrow (Figure 4-609) to facilitate insertion of the blade mounting plate in step 5).

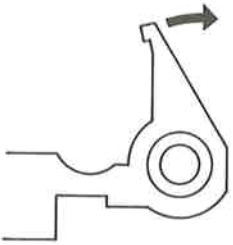


Figure 4-609

Note:
5. Check to make sure that the ball bearing (rear) is in perfect contact with the developing cylinder.

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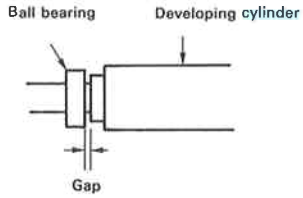

Figure 4-610

3) Set the ball bearing at the front.
4) Loosen the five screws holding the blade on the mounting plate.
5) Mount the mounting plate together with the blade on the bottle; two non-magnetic screws.

Note:
6. The gap between the developing cylinder and the blade is maintained by the presence of the scraper (front, rear); when mounting the scraper, make sure that it is butted against the blade.
7. Take care not to trap side seal 2 under the scraper.

6) Butt the blade lightly against the developing cylinder, and tighten the screws in the order shown in Figure 4-611.

Note:
8. Do not force the blade, or the cylinder rotation will be heavy.

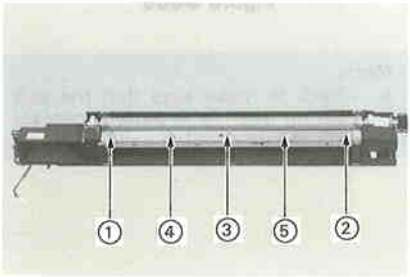

Figure 4-611

7) Turn the electrode plate at the rear into the direction of the arrow, and fix it with a self-tapping screw.

Note:
9. Check that the blade mounting plate and electrode plate are in perfect contact.
10. Check that the electrode plate has not ridden over the blade mounting plate.

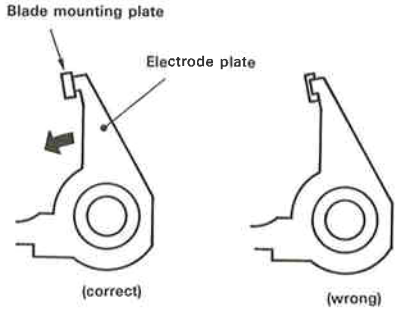

Figure 4-612

8) Mount the developing roller, pin, and gear B at the rear.
9) Mount the gear unit and bushing together; two non-magnetic screws.
10) Set gear A, and fix the grip ring.
11) Set the developing roller at the front, and fix it with a grip ring.

Note:
11. Allow a gap of about 0.3 mm between the roller and grip ring, and check that the roller rotates smoothly.

12) Set the magnetic fixing plate at the front.

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13) Push the magnetic fixing plate lightly into the direction of A, and release it.
14) Push the magnetic fixing plate into the direction of A further; i.e., from C, opposite of line B of the magnetic fixing plate, by two scales away.

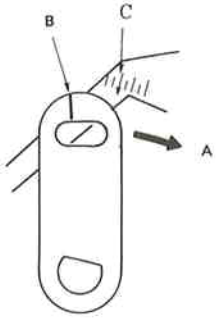

Figure 4-613

15) Mount the electrode plate at the front; one screw.

Note:
12. Check that the electrode plate is in perfect contact with the shaft of the developing cylinder, and there is no dust in between.

16) Pour toner into the cylinder unit of the black developing assembly and over the toner sensor as performed at time of installation.
17) Mount the developing lid with four non-magnetic screws, and mount the grip with one self-tapping screw.

6. Attaching the Side Seal

1) Attach the end of side seal 1 along the extension of the curve of the bottle shown in Figure 4-614 and the end of the bottle shown in Figure 4-615.
2) Attach the end of side seal 2 about 1 mm away from the top of seal 1 shown in Figure 4-614 and along the end of the bottle shown in Figure 4-615; put the seal over the boss.

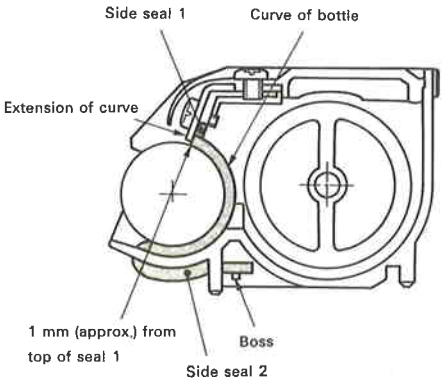

Figure 4-614

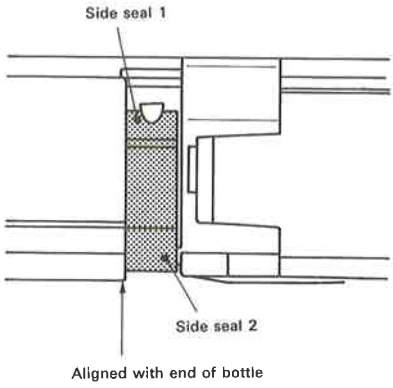

Figure 4-615

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VII. FIXING SYSTEM

A. Fixing Assembly

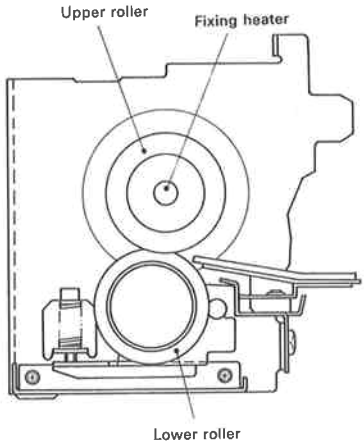


Figure 4-700 Cross Section of Fixing Assembly

1. Pressure Applying Mechanism

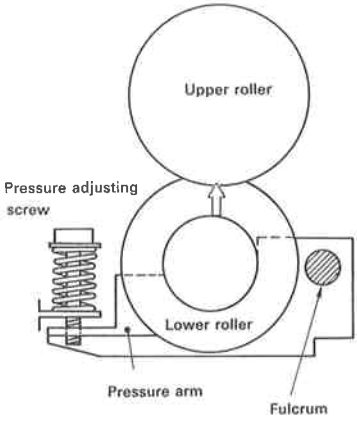


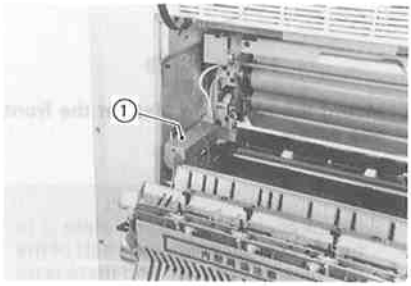
Figure 4-701

The position of the pressure arm shown in Figure 4-701 can be moved by turning the pressure adjusting screw at the front and rear of the fixing assembly.

When the pressure adjusting screw is turned clockwise, the lower roller moves in the direction of the arrow, and the roller pressure increases.

2. Removing the Fixing Assembly from the Copying Machine

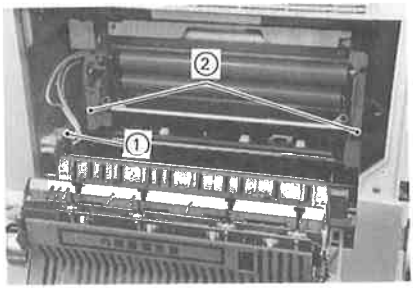
1) Open the front door.
2) Open the delivery unit.
3) Remove the knob from the fixing assembly; one screw, one washer.
4) Remove the connector cover; one screw.



①Connector cover

Figure 4-702

5) Remove the two connectors.
6) Remove the two screws, and pull out the fixing assembly.



① Connector ② Screws

Figure 4-703

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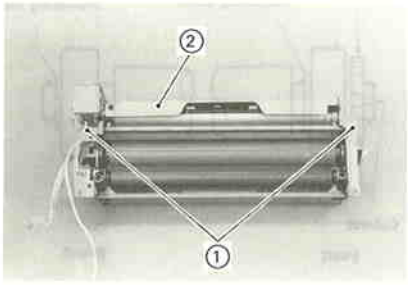
3. Removing the Heater, Upper Roller, and Lower Roller

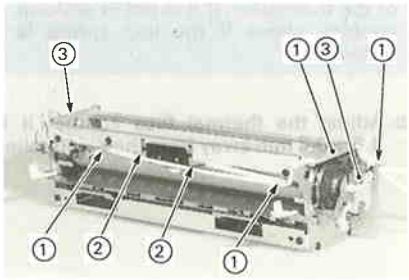
1) Remove the fixing assembly.
2) Remove the two screws, and remove the fixing cleaning unit.



① Screws ② Fixing cleaning unit

Figure 4-704

3) Remove the four harness retainers; one screw each.
4) Pull out the two fastons from the thermal fuse.
5) Remove the heater fixing plate (both sides), and pull out the heater.

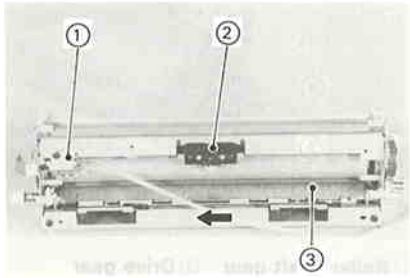


① Harness retainers ③ Heater fixing plate
② Fastons

Figure 4-705

Note:
Make sure that the connector is to the rear when the heater is mounted.

6) Remove the thermistor and thermal fuse; one screw each.
7) Swing the paper guide into the direction of the arrow to remove.

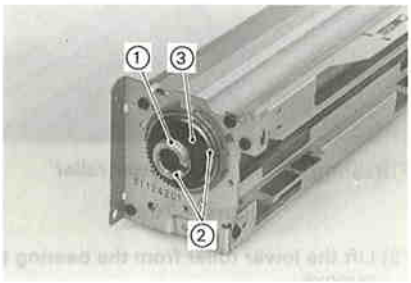


① Thermistor ③ Paper guide
② Thermal fuse

Figure 4-706

8) Remove the C-ring at the front, and remove the bearing (1,) together with the insulating bush.

Note:
The insulating bush is fragile; take care in handling it.



① C-ring ③ Bearing
② Insulating bush

Figure 4-707 (front)

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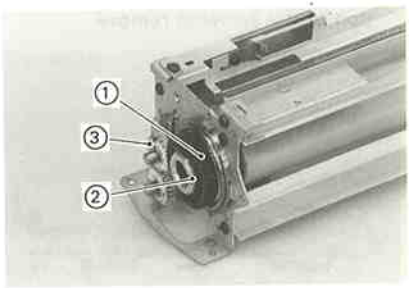
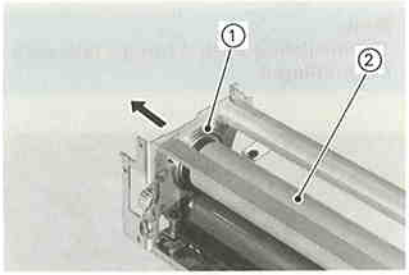
9) Remove the roller shaft gear at the rear; one C-ring.



① Roller shaft gear ③ Drive gear
② C-ring

Figure 4-708

10) Remove the drive gear; one E-ring each at both sides (Figure 4-708).
11) Remove the bearing at the rear, and pull out the upper roller while pushing it against the lower roller.



① Bearing ② Upper roller

Figure 4-709

12) Lift the lower roller from the bearing to remove.

4. Mounting the Heater

- Do not touch the heater surface.
- Mount it so that the connector is to the rear.

5. Mounting the Upper Roller

Mount the upper roller so that the side with a cut-out is to the rear.

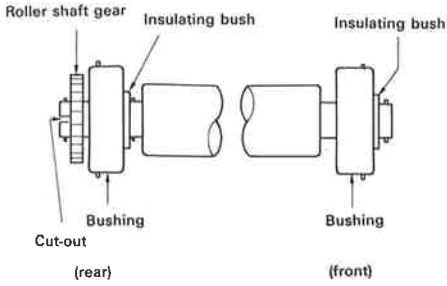


Figure 4-710

6. Mounting the Thermistor and Thermal Fuse

a. Check that the detecting face of the thermistor is in uniform contact with the surface of the upper roller.

Note:
There is no need to adjust the position of the thermistor; if it is not in uniform contact, check if the leaf spring is deformed.

b. Adjust the thermal fuse so that it is 4.5±0.3 mm away from the fixing roller.

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7. Adjusting and Measuring the Nip Width

a. Adjustment (tightening the pressure adjusting screw)

The nip width should be within the values given in Table 7-700; otherwise, turn the adjusting bolt.

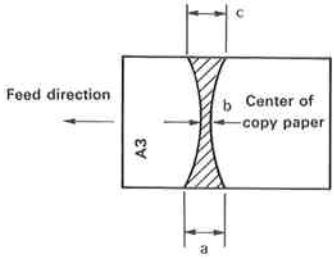

Figure 4-711

Note:
a and c refer to points 10 mm from both ends of the copy paper.

Dimension	Width*
b	4.5±0.5 mm
|a – c|	0.5 mm or less

* Measured when both upper and lower rollers are sufficiently heated.

Table 7-700

b. Measurement

If the roller is cool, wait 15 minutes after the warm-up is complete and make 20 copies before taking measurements.

1) Open the copyboard cover, and make a solid black copy in A3.
2) Turn the power OFF as soon as the leading edge of the copy paper comes out, and open the front door and delivery unit.
3) Turn the fixing assembly knob slightly clockwise; thereafter, turn the knob to remove the paper from the assembly.
4) Measure the width of the section shown in Figure 4-711; the toner should be shiny.

8. Mounting the Paper Guide

The paper guide can be removed by pulling it to the front. Likewise, it can be mounted by pushing it to the rear. Its position, therefore, need not be adjusted.

Note:
The position of the paper guide needs to be adjusted if the paper guide mount has been removed; avoid loosening the screw holding the mount. If removal is necessary, be sure to mark the position with a scriber in advance.

Note:
To adjust the position of the paper guide, place the fixing assembly on a desk with a washer (1 mm thick) in between, and move the paper guide mount so that it is 46.6 mm away from the desk as shown in Figure 4-712.

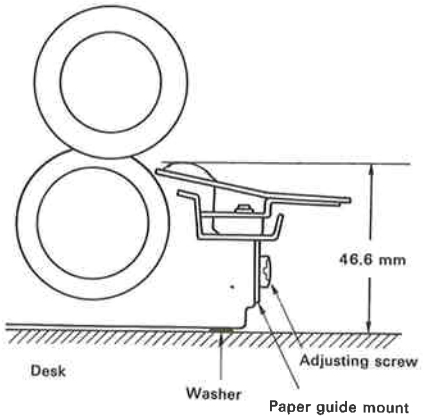

Figure 4-712

9. Lubrication

Apply heat-resisting grease (CK-0427) over the following on a periodical basis.

- Gear engagement (rear)
- Gear engagement (knob on fixing assembly; front)

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B. Fixing Cleaning Unit

1. Outline

The fixing cleaning unit is located above the fixing assembly and serves to clean the surface of the upper roller using a cleaning belt impregnated with silicone oil.

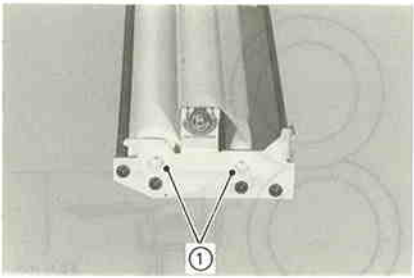
The cleaning belt is 15 m in length and is designed so that a red line comes into view 2.5 m from its end.

Note:
Be sure to clear the 'WEB' in the service mode after replacement of the cleaning belt.

2. Disassembly and Assembly

a. Detaching the Cleaning Belt

1) Remove the fixing assembly.
2) Remove the mounting screw, and remove the fixing cleaning unit.
3) Remove the screws, and remove the two bushings of the fixing cleaning unit; detach the cleaning belt.



①Bushings

Figure 4-713

b. Fitting the Cleaning Belt

The winding spindle, take-up spindle, and cleaning belt are designed as one entity. To mount it, perform the steps above, but in reverse order.

- Wind the cleaning belt around the shaft two to three times; at the time, check that the section at which the belt comes into contact with the roller is impregnated with oil.

Note:
Check to make sure that the cleaning belt is free of slacks or wrinkles and is correctly fit.

c. Removing the Cleaning Belt Drive Solenoid (SL2)

Mount the solenoid so that the section shown in Figure 4-714 is 0.3 ±0.1 mm when the lever is moved into the direction of A.

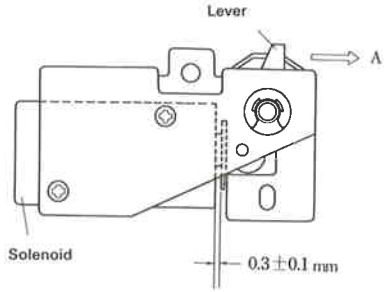


Figure 4-714

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VIII. ELECTRICAL SYSTEM

A. DC Controller

The DC controller is equipped with a built-in battery (BAT101); the battery can heat up if both of its terminals are shorted. Take note of the following:

1. When Removing the DC Controller

- Be sure to remove it together with the shield plate.

2. When Replacing the DC Controller

- When sending the DC controller to the workshop or factory, be sure it is intact with the shield plate and placed in a conductive bag. The bag should be transparent on one side; put the controller so that its face shows through the bag.
- After replacement, be sure to set the service modes and user options modes.

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CHAPTER 5

INSTALLATION

The copying machine is carefully adjusted and strictly inspected before it leaves the factory. Proper installation of the copying machine is very important in maintaining its out-of-factory performance.
Make sure that all the conditions discussed in this chapter are satisfied before installation, and carry out all necessary inspections after installation.

I. LOCATION 5-1
II. UNPACKING AND INSTALLATION 5-2
III. RELOCATION 5-7
IV. INSTALLATION OF DOCUMENT HOLDER 5-8
V. INSTALLATION OF CONTROL CARD V 5-9
VI. CHANGING THE CASSETTE SIZE 5-11
VII. CD UNIT INSTALLATION PROCEDURE 5-15

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I. LOCATION

The location of the copying machine should be chosen based on the following considerations. If possible, visit the customer for a study of the site before delivery of the copying machine.

- The wall outlet should be capable of providing the rated voltage.
- The ambient temperature should be between 7.5°C/45.5°F and 32.5°C/90.5°F and the humidity, 10% to 85%. Avoid locations near water faucets, humidifiers, water boilers, and refrigerators.
- Avoid locations near open fire or subject to dust or ammonia fumes and direct rays of the sun. Provide curtains over the windows if necessary.

Installation at a location subject to direct rays of the sun can hinder normal operation of AUTO PAPER SELECTION or AUTO REPRODUCTION SELECTION.

- Choose a well-ventilated location. The ozone generated by the machine is not of a concentration that may be harmful to the serviceman, but some individuals may find it unpleasant.
- Make sure all feet of the copying machine will be in contact with the floor. Allow at least 10 cm from any wall to provide access.

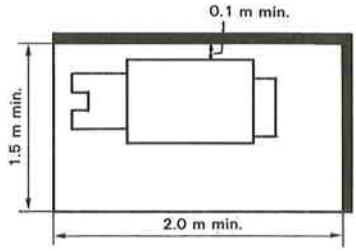

Figure 5-1

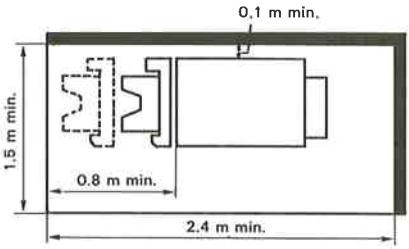

Figure 5-2 (with sorter)

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II. UNPACKING AND INSTALLATION

When a piece of metal is moved from a cold place to a warm place, droplets of water form on its surface. This phenomenon is known as condensation. Condensation affects the performance of machines. The simplest way to eliminate condensation from the copying machine, any machines for that matter, is to leave it alone until it warms to room temperature (at least one hour).

Step	Work	Checks	Remarks
1	Open the shipping carton.		
2	Pull out the four grips of the copying machine, lift the machine, and place it on the cassette feeding unit.	Take note of the location of the connection cable of the cassette feeding unit.	See the CASSETTE FEEDING UNIT INSTALLATION PROCEDURE.
3	Remove the eight screws to remove the rear cover of the copying machine; remove the screw to remove the face plate.		See Figure 5-3. Skip the step if the installation does not include the cassette feeding unit.
4	Open the cardboard box, and take out its contents.	Check that the following are available: • Drum unit • Copy tray • Document holder (mounting screws) • Cassettes • Drum unit • Measuring cup • Operator's Manual	
5	Remove the tape and fixing members (fixing assembly, cassettes).		See Figures 5-4 and -5. Do not remove the screws without a tag.
6	Release the feeder unit, remove the mounting screw, and remove the dummy drum.		See Figure 5-6. Save the screw for mounting the drum unit.
7	Pour the black toner into the hopper.		
8	Remove the connector and mounting screw, and remove the black developing assembly.		See Figure 5-7.
9	Remove the four screws, and remove the top cover of the developing assembly.		See Figure 5-8.
10	Remove the screw, and remove the handle unit cover of the black developing assembly.		See Figure 5-9.

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Step	Work	Checks	Remarks
11	Pour four cups of black toner into the black developing assembly.	Pour three cups of toner evenly over the cylinder, and pour one cup of toner over the toner sensor.	See Figure 5-10. (150 g)
12	Mount the top cover of the black developing assembly and handle unit cover.	Take care not to trap the toner sensor cord when mounting the handle unit cover.	
13	Mount the drum unit, and fix it in place with the screw removed in step 6).	• The drum separation claw is released automatically when the drum unit is inserted; do not touch the claw at the time. • Check that the drum separation claw is in contact with the drum after setting the drum unit.	Take care not to damage the drum when taking it out of the box.
14	Mount the black developing assembly in the copying machine; one screw, one connector.	Check that the connector cord is not trapped after mounting the assembly. Keep the cord in the hole.	See Figure 5-11.
15	Dry wipe the dust glass with lint-free paper.		
16	Move the primary and separation/transfer corona units in and out to clean the corona wires.		
17	Clean the pre-transfer corona wire, and mount the pre-transfer corona unit in the copying machine.		
18	Set the feeder unit.		
19	Connect the power plug, and shift the POWER switch to ' I '.	• Press the input keys and CLEAR key to check that the copy counter reading is correct. • Press the other keys to check that they operate correctly.	
20	Set the cassette in the copying machine, and set paper in the cassettes.		

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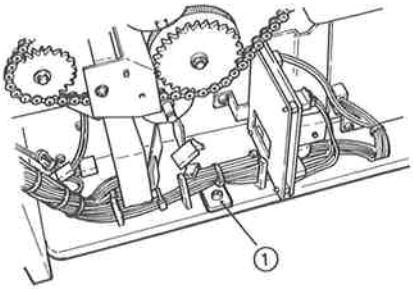
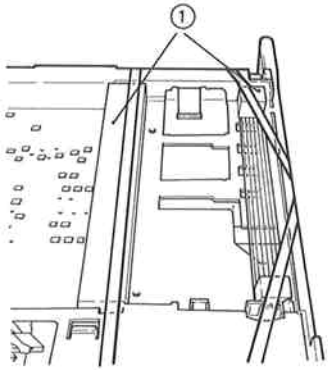
Step	Work	Checks	Remarks
21	Wait until the warm-up is over; thereafter, place the Test Sheet on the copyboard, and make a copy.	• Check that no abnormal sound is heard.	
22	Set the CD unit. (NP-3825 only)		See the CD UNIT INSTALLATION PROCEDURE.
23	Check that the copy image and copy operation are normal.	• Black copy • Color copy • Two-sided copy • Overlay copy • Manual feed copy	If the copy image has a problem, make adjustments according to the BASIC IMAGE ADJUSTMENT PROCEDURE.
24	Set the asterisk and user options modes to suit the needs of the user.		Use the service mode (✻5✻) for the user options.
25	Mount the copyboard, rear cover, and copy tray.		
26	Check that all external covers are free of damage and deformation.		
27	Clean up the area around the copying machine.		
28	Move the copying machine to its final location.	• Check that the copying machine is level.	
29	Enter necessary information into the Service Sheet.		



① Face plate

Figure 5-3



① Cassette plate fixing members

Figure 5-4

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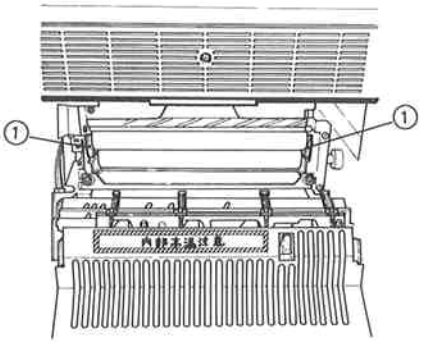
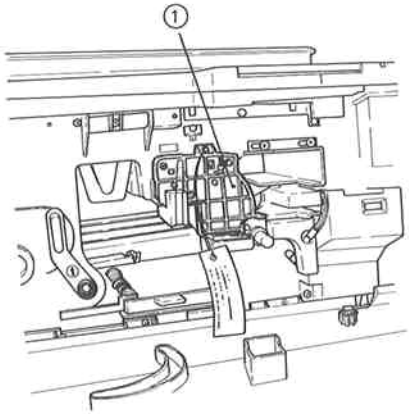


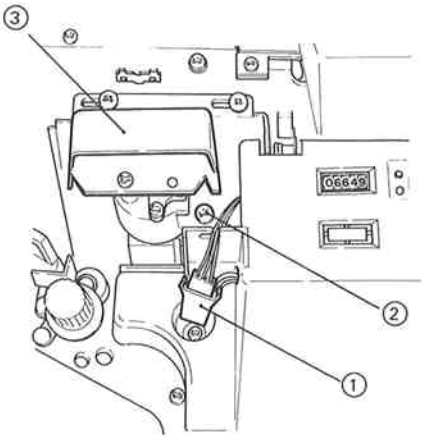
① Fixing roller spacers

Figure 5-5



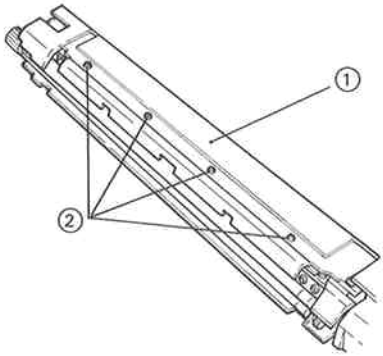
① Dummy drum

Figure 5-6



① Connector
② Screw
③ Black developing assembly

Figure 5-7



① Black developing assembly top cover
② Screws

Figure 5-8

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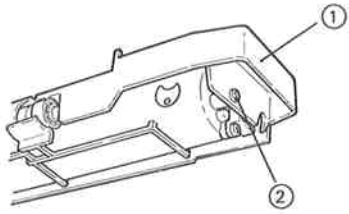
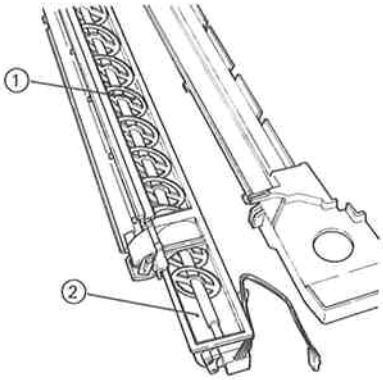


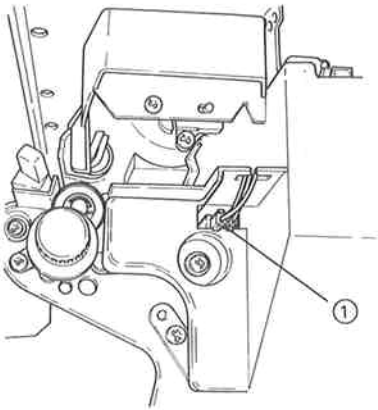
① Handle unit cover ② Screw

Figure 5-9



① Developing cylinder ② Toner sensor

Figure 5-10



① Connector cord

Figure 5-11

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III. RELOCATION

If the copying machine needs to be relocated by truck or other means of transportation, perform the following:

Step	Work	Checks	Remarks
1	Remove the drum unit. (NP-3825 only)	Keep the drum unit in a box for transport.	
2	Remove the CD unit.	Keep the CD unit in a box for transport.	
3	Mount the dummy drum.		
4	Tape the corona units, feeder unit release lever, and lower feeder unit release lever so that they will not be shaken out of place during transport.		
5	Tape the front door and delivery unit cover.		
6	Place an A3 sheet on the copy-board glass, and tape the copy-board cover.		

Note:
If the copying machine needs to be lifted when loading onto a truck not equipped with a lifter, detach it from the cassette feeding unit.

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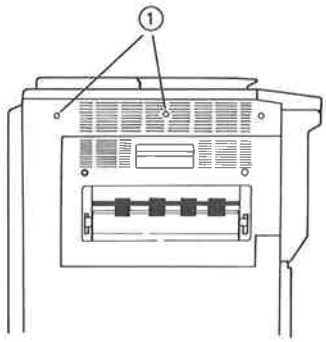
IV. INSTALLATION OF DOCUMENT HOLDER

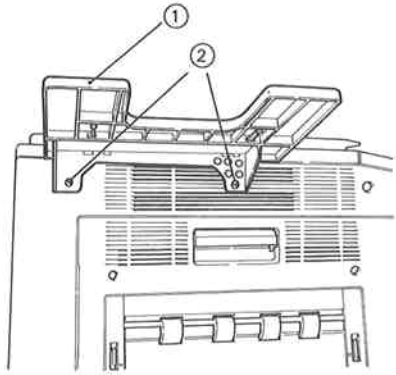
1) Remove the two screws from the left cover.



① Screws (not used)

Figure 5-12

2) Mount the document holder.



① Document holder ② Mounting screws

Figure 5-13

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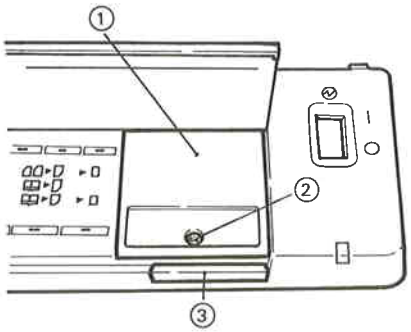
V. INSTALLATION OF CONTROL CARD V

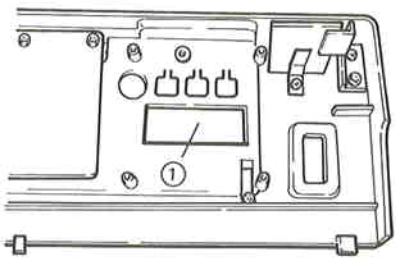
1) Open the front door, and remove the inside cover (right).
2) Remove the control panel. (See p. 4-3.)
3) Remove the transparent sheet from the memory memo sheet.
4) Remove the mounting screw from the face cover under the transparent sheet.



① Face cover
② Mounting screw
③ Face plate

Figure 5-14

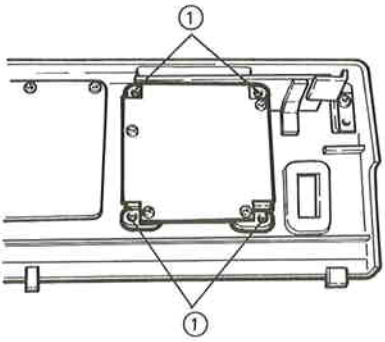
5) Turn over the control panel, and remove the face plate.
6) Remove the protection sheet over which the display of control card V is attached.
7) Place the transparent sheet over the hole in the display.



① Hole

Figure 5-15

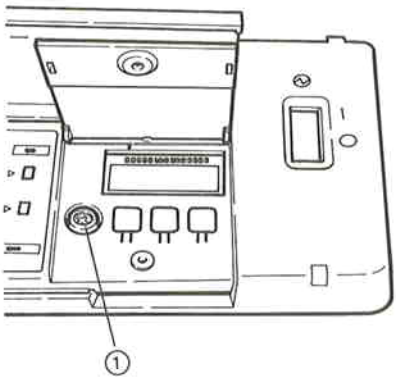
8) Fix control card V on the control panel with four mounting screws.
Insert a card into control card V, and fix control card V at a point where insertion or removal of the card is smooth.



① Holes for mounting screws

Figure 5-16

Further, check that the connector for the printer is at the center of the hole.



① Connector for printer

Figure 5-17

9) Fix the grounding wire of control card V.

Note:
Keep the grounding wire as far away as possible from the DC harness.

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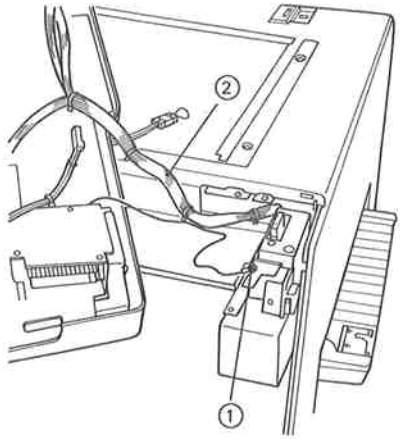
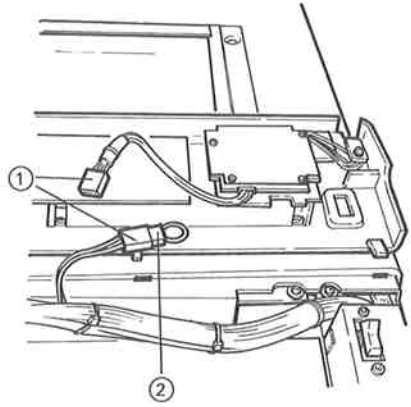


① Grounding wire ② DC harness

Figure 5-18

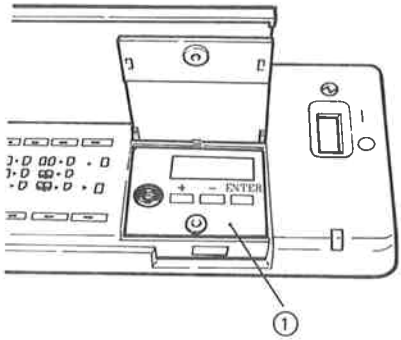
10) Pull out the shorting connector shown in Figure 5-20.
11) Connect the 4P connector of control card V and the 4P connector of the copying machine.



① 4P connector ② Shorting connector

Figure 5-19

12) Mount the control panel on the copying machine.
13) Remove the protection sheet from the markings plate (control panel) of control card V.
14) Attach the markings plate (control panel) of control card V on the control panel of the copying machine.



① Markings plate

Figure 5-20

15) Attach the transparent sheet removed in step 3).
16) Turn the copying machine ON, and check the operation of control card V.
17) Mount the inside cover (right).

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VI. CHANGING THE CASSETTE SIZE

1) Turn the cassette over, and remove the screw holding the rear end plate.

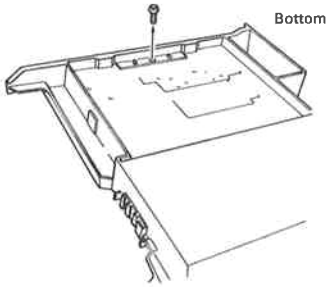

Figure 5-21

2) Move the rear end plate to the desired size referring to the indexes on the bottom of the cassette; see Table 5-1.

Paper	Notation
AUSTRALIAN FOOLSCAP FOLIO	AUS·FLS FOLIO
ARGENTINE LETTER	Arg.
ARGENTINE LETTER R	Arg.R
ARGENTINE LEGAL	Arg.LGL
GOVERNMENT LETTER	G.
GOVERNMENT LETTER R	G.R
GOVERNMENT LEGAL	G.LGL
KOREAN GOVERNMENT	K.
KOREAN GOVERNMENT R OFICIO	K.R OFC
EQUADORAN OFICIO	E.
BOLIVIAN OFICIO	BLV

Table 5-1

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■ BA, A4-R, LGL, ARG. R, FLS, G. R, FOIO G. and LGL, AUS. FLS, BLV., ARG. and LGL, E. OFC
For the above, use two rear end plates; refer to the indexes on the bottom of the cassette for the positions.

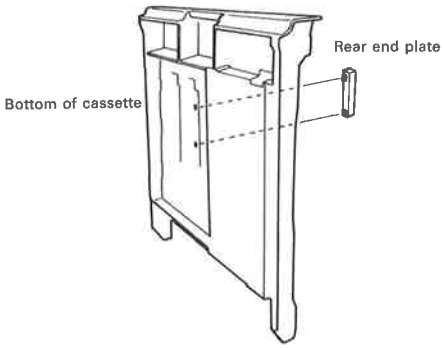

Figure 5-22

3) Fix the plates with screws (M4X6).

■ To change to a spring of a different type, skip step 4) and go to step 7).

Paper	Color of spring
A4/A3 11×17/LTR/I	Green
A4R/B5R/LTR-R LGL/STMT/II	Yellow
B4/B5	Red

Table 5-2

I: Arg., G., K.
II: Others

4) Remove the screws holding the paper size partition.

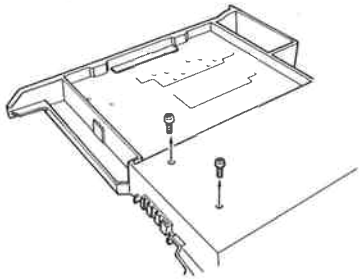

Figure 5-23

5) Slide the paper size partition along the indexes on the bottom of the cassette to the desired paper size together with the spring.

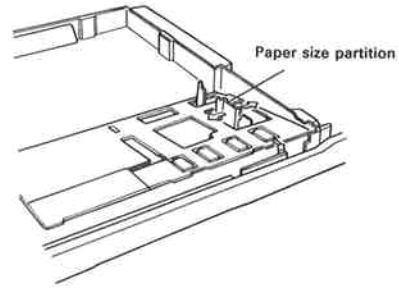

Figure 5-24

6) Fix the paper size partition with the two screws removed in step 4); go to step 13).
7) Remove the two rubber stops from the middle plate.

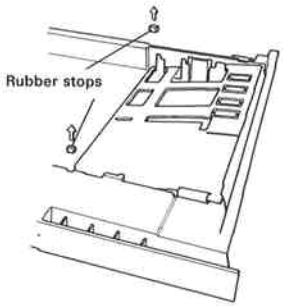

Figure 5-25

8) Remove the middle plate and the spring.

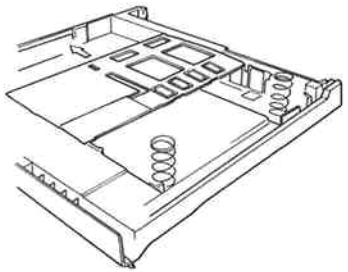

Figure 5-26

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9) Put the cassette on its side, and remove the two screws holding the paper partition.

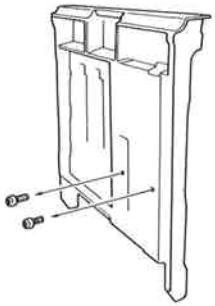

Figure 5-27

10) Slide the paper size partition to the indexes on the bottom of the cassette for the desired paper size, and fix it with the two screws removed in step 9).
11) Change the spring according to the specification.

12) Set the face plate of the middle plate according to the table.

Paper	Middle and face plates
A3	ⓐ ⓑ ⓒ ⓓ
11 × 17	ⓐ ⓑ ⓒ ⓓ
A4	ⓐ ⓑ ⓒ ⓓ
LETTER	ⓐ ⓑ ⓒ ⓓ
Argentine LETTER	ⓐ ⓑ ⓒ ⓓ
Government LETTER	ⓐ ⓑ ⓒ
Korean Government	ⓐ ⓑ ⓒ
B4	ⓐ ⓑ ⓒ
B5	ⓐ ⓑ ⓒ
A4–R	ⓐ ⓑ
LETTER–R	ⓐ ⓑ
Argentine LEGAL	ⓐ ⓑ
Government LETTER–R	ⓐ ⓑ
Government LEGAL	ⓐ ⓑ
Argentine LETTER–R	ⓐ ⓑ
Foolscap	ⓐ ⓑ
Folio	ⓐ ⓑ
Aus-Foolscap	ⓐ ⓑ
OFFICIO	ⓐ ⓑ
Equadoran OFICIO	ⓐ ⓑ
Bolivian OFICIO	ⓐ ⓑ
LEGAL	ⓐ ⓑ
Korean Government–R	ⓐ
B5R	ⓐ

Table 5-3

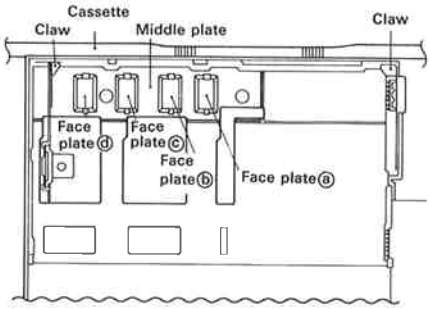

Figure 5-28 Cassette (top view)

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13) Set the middle plate, and fit the rubber stops.

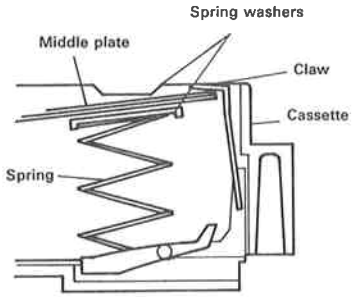

Figure 5-29

Check that the rubber stops are mounted correctly, and the spring at the rear is mounted correctly on the spring washer on the back of the middle plate.

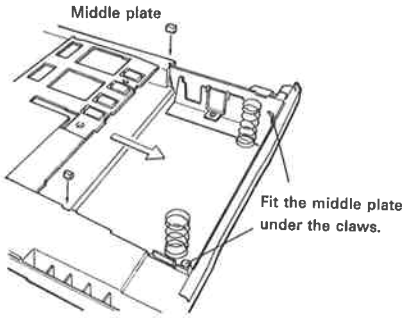

Figure 5-30

14) Set the cassette size detecting roller according to the index on the cassette.

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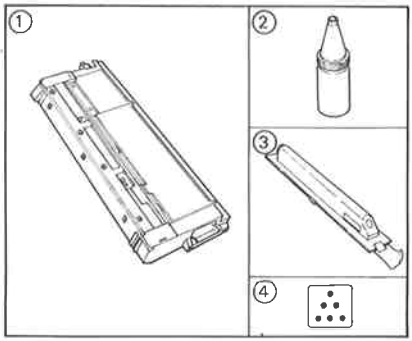
VII. CD UNIT INSTALLATION PROCEDURE

A. Unpacking

Unpack the shipping cartons, and make sure all the items shown in Figure 5-32 are available.



① CD unit	1 unit
② Starter developer	1 pc.
③ Toner cartridge	2 pcs.
④ Color toner label	1 pc.

Figure 5-31

B. Installation

1) Open the front door of the copying machine, insert the door switch actuator into the door switch, and turn the power ON.

■ Skip steps 2) through 4) if the CD unit is for red toner.

2) Remove the front cover of the CD unit; 2 screws.

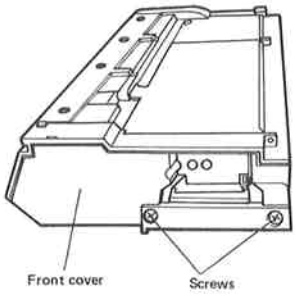


Figure 5-32

3) Cut the lead wires (JP851, JP852) on the PCB to suit the color of the toner.

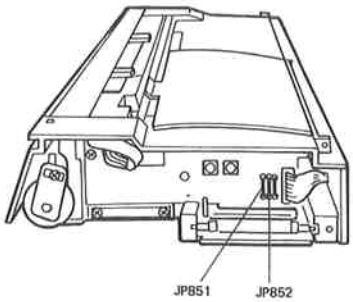


Figure 5-33

	JP851	JP852
Red	–	–
Blue	Cut	–
Green	–	Cut
Brown	Cut	Cut

Table 5-4

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4) Mount the front cover back on the CD unit.
5) Attach the color toner label on the front cover.
6) Remove the top cover from the CD unit; 4 screws.

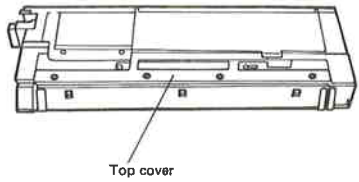

Figure 5-34

7) Shake the developer container lightly up and down about ten times.
8) Hold the container, and detach the funnel by turning it counterclockwise.

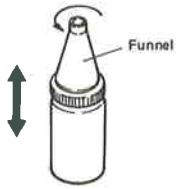

Figure 5-35

9) Peel the seal off the container.

Figure 5-36

10) Put the funnel back on the container.

11) Pour the developer into the developing cylinder of the CD unit.

Note:
Take care not to spill the developer; inadequate developer can result in foggy images.

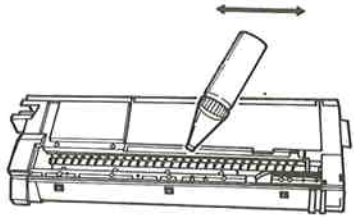

Figure 5-37

12) Put the cover back on the CD unit.

Note:
Tighten the screws in the order shown in Figure 5-38.

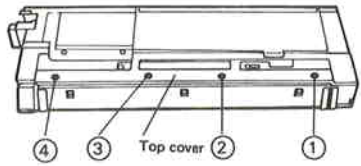

Figure 5-38

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14) Check that the copying machine is in the standby mode; if in WMUP, wait until it enters the standby mode.
15) Set the CD unit inside the copying machine.
16) Check that the index of the fine-tuning VR (VR852) is centered.

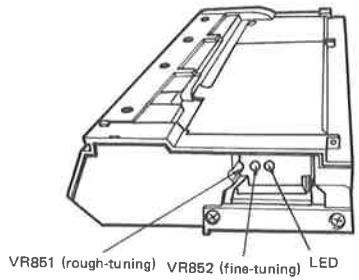

Figure 5-39

17) Push the service mode switch of the copying machine with a hex key.
- The copying machine will enter the service mode and display 'S' on its message display.

18) Press the ☒, 4 and ☒ keys in the order named.
- The copying machine will enter the function mode.
- 'FUNCTION 00' will be indicated.

19) Press the 7 key.
- 'FUNCTION 07' will be indicated.

20) Press the ☒ key; the CD unit will be engaged, and the cylinder starts to rotate.
- Press the ☒ key, and wait for 30 seconds; thereafter, perform the following:

21) Insert a flat-blade screwdriver through the hole in the front plate, and turn VR851 (rough) of the CD unit until LED851 goes ON.
- The CD unit will be released automatically after three minutes; take note.
- If the LED keeps flashing and adjustment is difficult, turn VR852 (fine) so that it will remain lit. Use VR851 only if possible, and keep the index of VR852 centered.

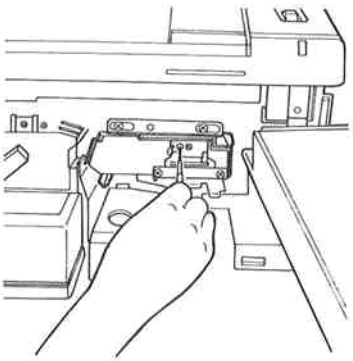

Figure 5-41

22) Press the ☒ key after adjustment to stop the rotation of the cylinder.
23) Check that the main motor has stopped, and press the reset key C twice to leave the service mode.
24) Pull up the CD unit support plate of the copying machine, and draw out the CD unit.

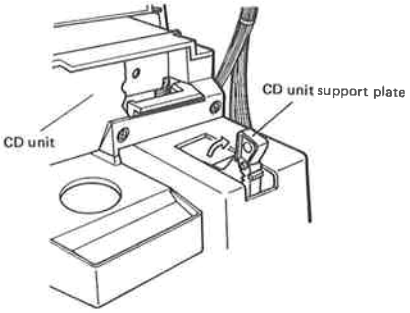

Figure 5-42

25) Release the two locks, and open the toner supply cover of the CD unit.
26) Shake the toner cartridge left and right several times to even out the toner.
27) Set the toner cartridge in the CD unit.
28) Hold the toner cartridge, and peel the seal until 'STOP' comes into view.
29) Tap lightly on the top of the cartridge.
30) Hold the CD unit, and pick and remove the cartridge.
31) Close the toner supply cover, and engage the two locks.

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32) Set the CD unit inside the copying machine .
33) Pull out the door switch actuator.
34) Close the front door, and make and check color copies.

Note:
Keep the shipping box for storing the CD unit.

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CHAPTER 6

MAINTENANCE AND SERVICING

I. PARTS TO BE REPLACED PERIODICALLY 6-1
II. CONSUMABLES 6-2
III. PROCEDURE FOR PERIODICAL SERVICING 6-4
IV. PERIODICAL SERVICING CHART 6-5

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I. PARTS TO BE REPLACED PERIODICALLY

The table below is a list of parts to be replaced periodically in maintaining the performance of the copying machine. Replace them as scheduled even when they seem to be free of damage or deformation. Should they fail, the effect will be considerable.

Arrange the schedule so that the replacement may be made during the service call closest to the end of their life.

as of Apr., 1989

No.	Parts name	Parts No.	Qt'y	Interval*	Remarks
1	Corona wire (primary, pre-transfer, transfer/separation)	FY3-0030-000	–	30,000	100 V
		FY3-0040-000	–	30,000	115/220/240 V
2	Pre-transfer corona unit	FG1-8040-000	1	100,000	
3	Side seal (CD unit)	FA5-2720-000	2	200,000**	
4	Side seal (black developing assembly)	FA3-8590-000	2	200,000	
5	Side spacer (black developing assembly)	FA3-8586-000	2	200,000	
6	Butting roller (black developing assembly)	FS2-6019-000	2	200,000	
7	Butting roller (CD unit)	FS2-6004-000	2	200,000**	
8	Ozone filter (heat exhaust fan)	FA6-3268-000	1	100,000	or 1 yr
9	Ozone filter (feeder fan)	FA6-3501-000	1	100,000	or 1 yr
10	Filter (scanner cooling fan)	FA6-3512-000	1	200,000	or 1 yr

* Copies.
** With the CD unit in use.

Note:
The values above are estimates only and subject to change based on future data.

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II. CONSUMABLES

The following is a table of consumables which, over the warranty period of the copying machine, are expected to need replacement once or more because of deterioration or damage. The life of the consumables is expressed in terms of the number of copies processed; replace them when they prove to be faulty.

A. Copying Machine

as of Apr., 1989

No.	Parts name	Parts No.	Qt'y	Life*	Remarks
1	Drum separation claw	FA3-8577-030	4	100,000	
2	Pick-up roller (pick-up unit)	FF2-2388-000	12	200,000	
3	Registration roller (upper)	FF2-2212-000	1	300,000	
4	Registration roller (lower)	FF2-2213-000	1	300,000	
5	Scanning lamp	FH7-3113-000	1	100,000	100/115 V
		FH7-3114-000	1	100,000	220/240 V
6	Corona wire cleaner (transfer/ separation corona unit)	FF2-2246-000	1	100,000	
7	Blank exposure lamp	FH7-3179-000	1	300,000	
8	Cleaning belt (fixing assembly)	FA3-8908-000	1	100,000	
9	Upper roller (fixing assembly)	FA6-3024-000	1	200,000	
10	Lower roller (fixing assembly)	FA5-1917-000	1	200,000	
11	Upper separation claw (fixing assembly)	FA9-0451-000	4	200,000	
12	Lower separation claw (fixing assembly)	FA2-9037-000	4	200,000	
13	Insulating bush (fixing assembly)	FA5-2967-000	2	200,000	
14	Pre-exposure lamp	FH7-3069-000	1	200,000	
15	Developing cylinder (black developing assembly)	FA5–2594-000	1	300,000	
16	Thermistor (fixing assembly)	FH7-7207-000	1	300,000	
17	Halogen heater (fixing assembly)	FH7-4266-000	1	500,000	100 V
		FH7-4267-000	1	500,000	115 V
		FH7-4268-000	1	500,000	220 V
18	Halogen heater (fixing assembly)	FH7-4269-000	1	500,000	240 V
19	Bearing (fixing assembly)	XG9-0181-000	2	500,000	
20	Scanner drive cable	FA6-3450-000	1	500,000	
21	ATR window (CD unit)	FA5-2672-000	1	50,000**	

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as of Apr., 1989

No.	Parts name	Parts No.	Qt'y	Life*	Remarks
22	Starter developer red (CD unit)	F41-6012-000	1	50,000**	
	Starter developer green (CD unit)	F41-6022-000	1	50,000**	
	Starter developer blue (CD unit)	F41-6032-000	1	50,000**	
	Starter developer brown (CD unit)	F41-6042-000	1	50,000**	
23	Developing cylinder (CD unit)	FA5-2690-000	1	200,000**	
24	Developing drive gear (black developing unit)	FS3-0565-000	1	300,000	
25	Lower roller cleaner (fixing assembly)	FA5-3015-000	1	100,000	

* Copies.
** With the CD unit in use.

Note:
The values above are estimates only and subject to change based on future data.

B. Cassette Feeding Unit

as of Apr., 1989

No.	Parts name	Parts No.	Qt'y	Life*	Remarks
1	Pick-up roller	FF2-2388-000	12	200,000	
2	Feeder roller	FA6-3836-000	2	100,000	

* Copies.

Note:
The values above are estimates only and subject to change based on future data.

C. Paper Deck

No.	Parts name	Parts No.	Qt'y	Life*	Remarks
1	Pick-up roller	FF9-1003-000	2	100,000	
2	Feeder roller	FL9-0015-000	1	100,000	
3	Separation roller	FL9-0010-000	1	100,000	
4	Registration roller	FA5-8434-000	1	300,000	

* Copies.

Note:
The values above are estimates only and subject to change based on future data.

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III. PROCEDURE FOR PERIODICAL SERVICING

Note:
Arrange for periodical servicing once every 10,000 copies, as a rule.
Before setting out for a visit, check the servicing record, and take replacement parts if necessary.

Step	Work	Checks	Remarks
1	Meet the user.	Check the condition.	
2	Check the counter reading.	Check problem copies.	
3	Make test copies: DIRECT, REDUCE, ENLARGE, page separation, two-sided, overlay	a. Image density b. Background (dirt) c. Characters (clarity) d. Leading edge (margin) e. Left/right sides (margin) f. Fixing, registration, back g. Noise h. Counter (operation)	
4	Clean the corona units.		Dry wipe with lint-free paper; thereafter, with alcohol.
5	Clean the transfer guide.		Remove the drum unit.
6	Clean the separation and feeder units. • Separation claw • Feeder belt • Feeder guide		Thereafter, mount the drum unit back.
7	Clean the fixing and delivery units. • Inlet guide • Separation claws (upper, lower) Check the cleaning belt.		Use cleaning oil.
8	Perform periodical servicing according to the number of copies processed.		
9	Clean the copyboard cover and copyboard glass.		Use alcohol.
10	Make test copies.		
11	Make sample copies.		
13	Organize the sample copies, and clean up the area around the machine.		
14	Enter necessary information into the Service Sheet, and report to the user.		

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IV. PERIODICAL SERVICING CHART

Note:
Do not use solvents/oils other than those specified.

△: Clean ●: Replace ×: Oil □: Adjust ◎: Check

Unit	Part	Intervals					Remarks
		every 10,000 copies	every 30,000 copies	every 50,000 copies	every 100,000 copies	every 200,000 copies	
Externals	Copyboard glass	△					
	Ozone filter				●		or 1 yr
	Scanner fan filter					●	or 1 yr
Pick-up unit	Drive gear			×			
	Pick-up roller bushing			△×			
Transfer/separation and feeder units	Transfer/separation corona unit rail			△			Use a moist cloth.
	Feeder belt, feeder guide plate	△					
	Gear			×			
Scanner	Mirrors 1 through 6			△			Use a blower brush. If too dirty, use alcohol
	Dust glass	△					
	Lens			△			Use a blower brush.
	Scanner lamp reflector			△			
	Pre-exposure lamp			△			
	Blank exposure lamp	△					Use a moist cloth.
	AE sensor			△			Use a blower brush.
	Scanning lamp			△			Use a dry cloth.
	Document sensor			△□			Use a blower brush.
	Scanner rail			△×			Use alcohol; thereafter, apply oil.
Corona unit	Corona wires (primary, pre-transfer, transfer/separation)	△	●				Use lint-free paper; thereafter use alcohol. Do not use water.
	Primary corona unit grid wire	△					
	Shield plate, block (primary, pre-transfer, transfer/separation)	△					
	Pre-transfer corona unit	△			●		
Black developing assembly, CD unit*	Butting roller			△		●	
	Bottle			△			Use a moist cloth.
	Rail (mainframe)			△×			Apply grease.
	Pressure clutch			△×			Apply oil.
	Side seal					●	
	Side spacer					●	

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Unit	Part	Intervals					Remarks
		every 10,000 copies	every 30,000 copies	every 50,000 copies	every 100,000 copies	every 200,000 copies	
Fixing assembly	Fixing rollers (upper, lower)	△					Use cleaning oil. (TKN-0464)*
	Separation claws (upper, lower)	△					Use solvent.
	Inlet guide	△					
	Static eliminating brush	△					Remove lint with lint-free paper.
	Lower roller felt			△			Scrape toner off.
	Cleaning belt	◎					Check the length.
Cassette feeding unit	Pick-up roller bushing				△×		

* For the CD unit, the interval refers to the number of copies processed with the use of the CD unit.

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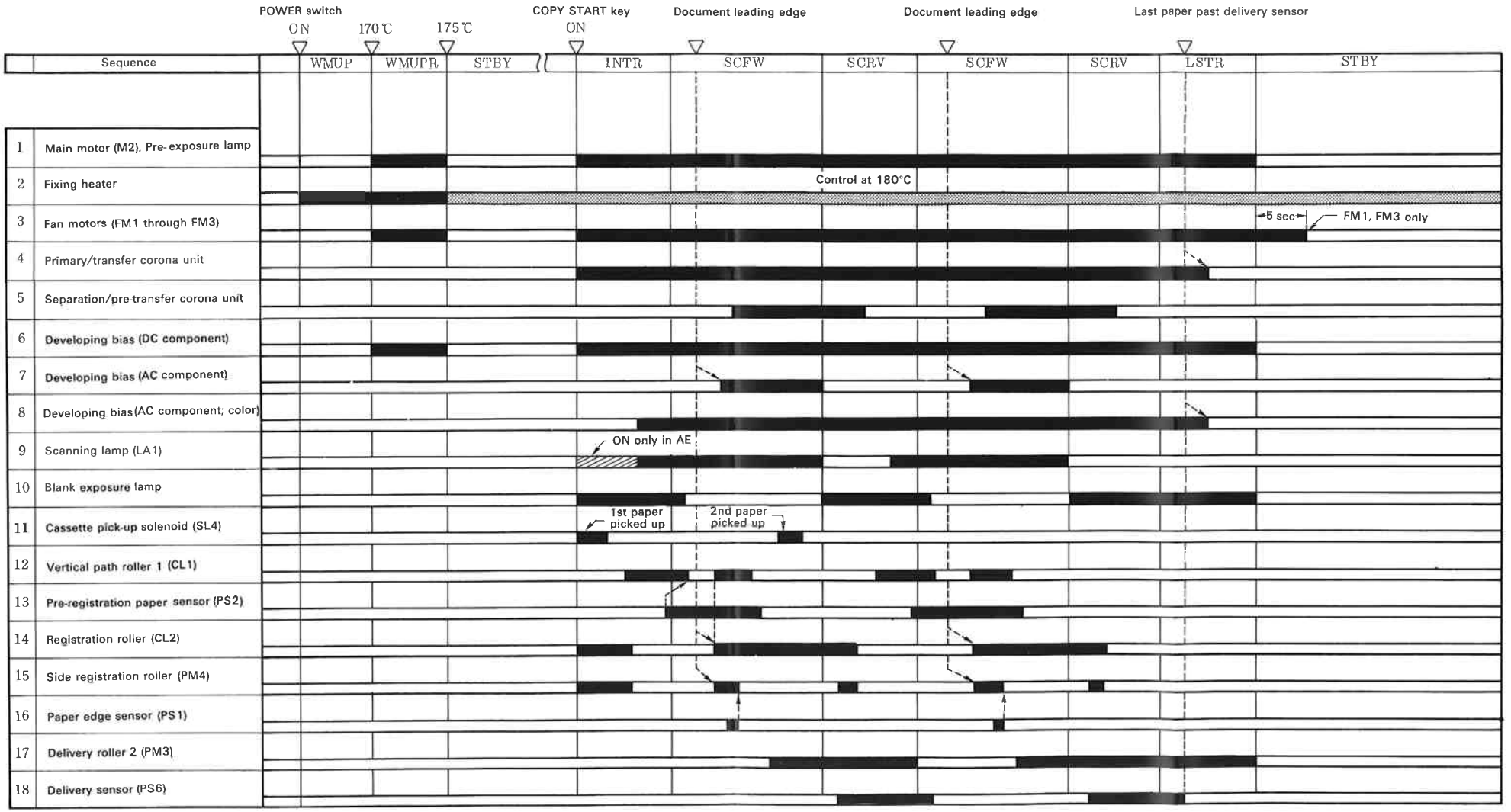
(A4, 2 copies, DIRECT, one-sided to one-sided; pick-up from cassette 1)



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B. LIST OF SIGNALS/ABBREVIATIONS

1. SIGNALS

ACCUT	AC LINE CUT command
AEDATA	AE SENSOR OUTPUT signal (analog)
BDPRS	BLACK DEVELOPING ASSEMBLY ENGAGE DETECTION signal
BTEP	BLACK TONER OUT signal
C1PD	CASSETTE 1 PAPER DETECTION signal
C2PD	CASSETTE 2 PAPER DETECTION signal
C3PD	CASSETTE 3 PAPER DETECTION signal
C4PD	CASSETTE 4 PAPER DETECTION signal
CBCC	COPYBOARD COVER CLOSED signal
CCD	CONTROL COUNTER DRIVE command
CCDT	CONTROL COUNTER DETECTION signal
CNT1D	COUNTER1 DRIVE command
CNT2D	COUNTER2 DRIVE command
CLBSD	CLEANING BELT DRIVE SOLENOID DRIVE command
CRGA	CROSS FEED REGISTRATION MOTOR DRIVE PULSE command A
CRGB	CROSS FEED REGISTRATION MOTOR DRIVE PULSE command B
CRGPD	CROSS FEED REGISTRATION PAPER DETECTION signal
CRGSTB	CROSS FEED REGISTRATION MOTOR STROBE signal
CT1	COLOR TONER signal 1
CT2	COLOR TONER signal 2
CT3	COLOR TONER signal 3
CTEP1	COLOR TONER OUT signal 1
CTEP2	COLOR TONER OUT signal 2
CTLON	COLOR TONER LED ON command
CTSSD	COLOR TONER SUPPLY
DFA	DELIVERY FEED MOTOR DRIVE PULSE command A
DFB	DELIVERY FEED MOTOR DRIVE PULSE command B
DPRSL	DEVELOPING ASSEMBLY PRESSURE SOLENOID DRIVE command
DRMD	DRUM (MAIN MOTOR) DRIVE command
DSIN	DF SERIAL OUTPUT signal
DSZ1	DOCUMENT SIZE DETECTION signal 1 (analog)
DSZ2	DOCUMENT SIZE DETECTION signal 2 (analog)
DSZ3	DOCUMENT SIZE DETECTION signal 3 (analog)
ECNT	EDITING UNIT CONNECT signal
EXPD	EXIT PAPER DETECTION signal
FMD	FAN MOTOR DRIVE command
FRST	FIXING ROLLER SURFACE TEMPERATURE signal (analog)
HMD	HOPPER MOTOR DRIVE command
HTRD	HEATER DRIVE command
HVAC	AC TRANSFORMER DRIVE command
HVBAC	AC DEVELOPING BIAS DRIVE command
HVBDC	DC DEVELOPING BIAS CONTROL command (analog)
HVPR	PRIMARY CORONA CURRENT CONTROL command (analog)
HVPT	PRE-TRANSFER CORONA CURRENT CONTROL command (analog)
HVSP	SEPARATION CORONA CURRENT CONTROL command (analog)
HVTR	TRANSFER CORONA CURRENT CONTROL command (analog)
LAON	SCANNING LAMP ON signal
LFA	LOWER FEED MOTOR 1 DRIVE PULSE command A
LFB	LOWER FEED MOTOR 1 DRIVE PULSE command B
LFENPD	LOWER FEED UNIT ENTER PAPER DETECTION signal
LFEXPD	LOWER FEED UNIT EXIT PAPER DETECTION signal
LHP	LENS HOME POSITION signal
LINT	LIGHT INTENSITY signal (analog)
LNA	LENS MOTOR DRIVE PULSE A command
LNB	LENS MOTOR DRIVE PULSE B command
LNSTB	LENS MOTOR STROBE signal
MFPD	MANUAL FEED PAPER DETECTION signal
MFSSL	MANUAL FEED ROLLER SOLENOID DRIVE command
MMDP	MAIN MOTOR DRIVE PULSE command
OLED	ORIGINAL SIZE DETECTION LED ON command
PEXP	PRE-CONDITIONING EXPOSURE LAMP LIT command
PUCD1	PICK-UP ROLLER CLUTCH 1 DRIVE command
PUCD2	PICK-UP ROLLER CLUTCH 2 DRIVE command
RGCL	REGISTRATION ROLLER CLUTCH SOLENOID DRIVE command
RGPD	REGISTRATION PAPER DETECTION signal
SCCUP	SCANNER MOTOR UP DRIVE command
SCPD	SCANNER POSITION DETECTION signal
S OPEN	SIDE DOOR OPEN signal
WTOF	EXCESS WASTE TONER signal

2. ABBREVIATIONS

INTR	INITIAL ROTATION
LSTR	LAST ROTATION
SCFW	SCANNER FORWARD
SCRV	SCANNER REVERSE
STBY	STANDBY
WAIT	WAIT
WMUP	WARM UP
WMUPR	WARM UP ROTATION

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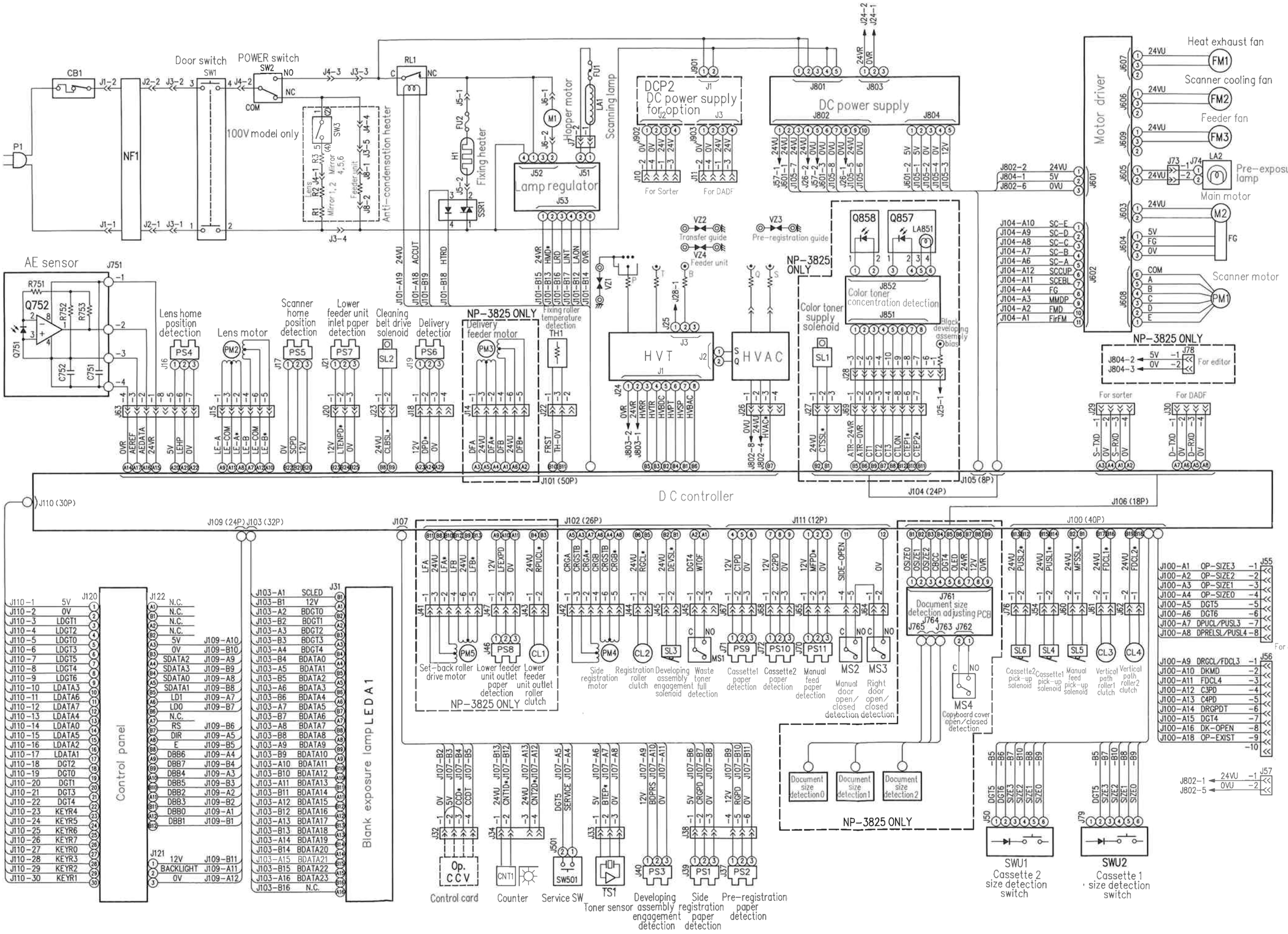

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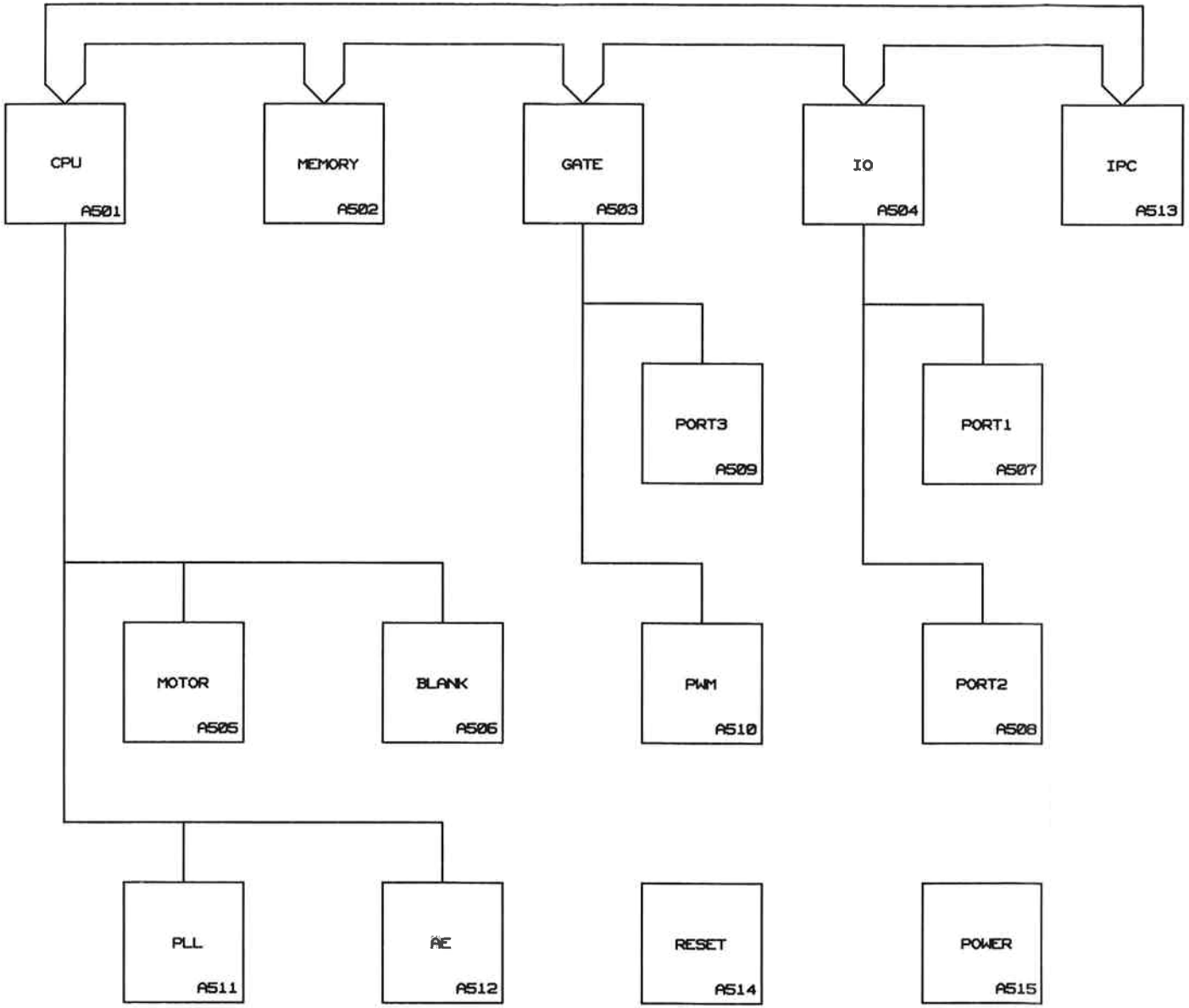

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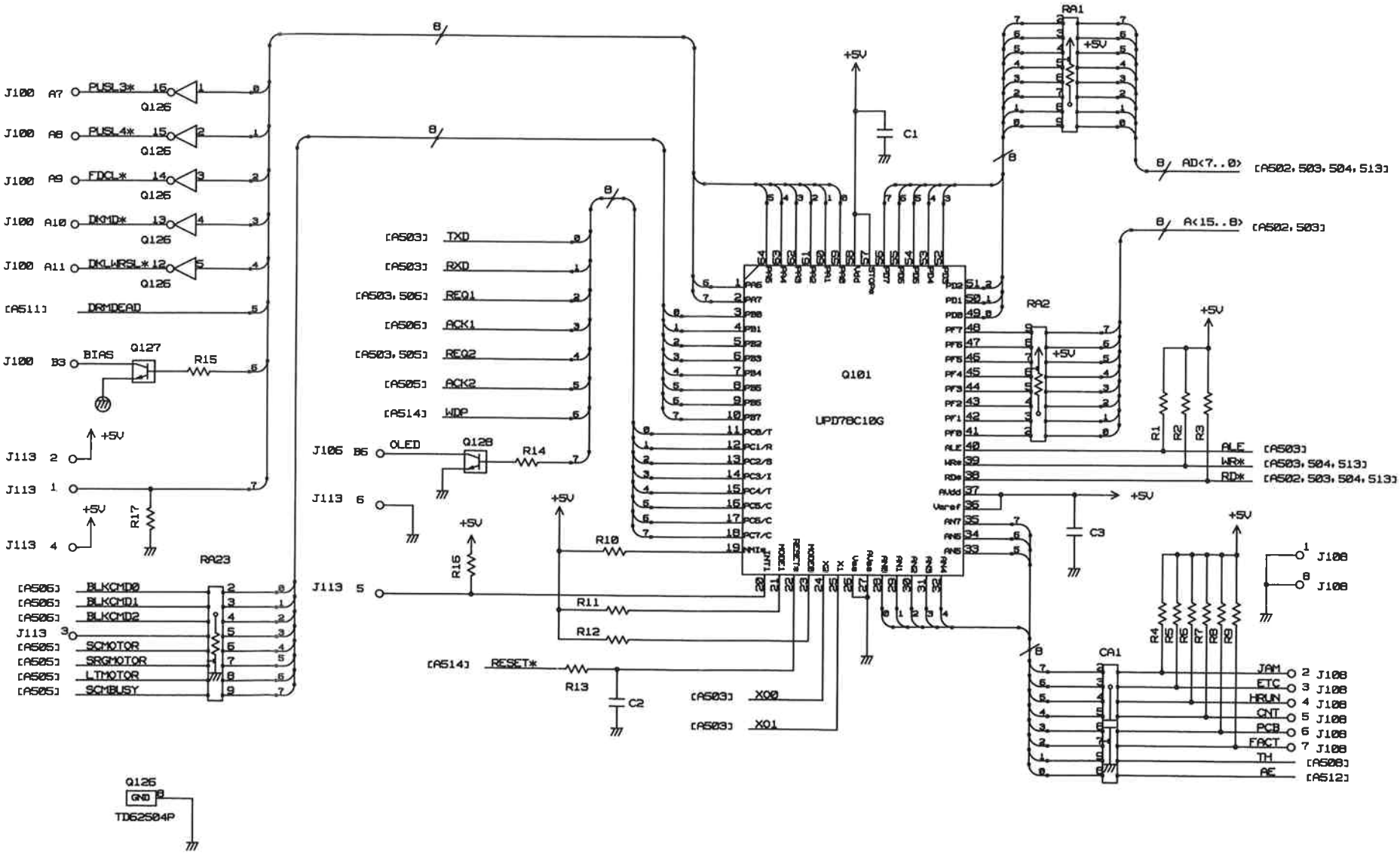

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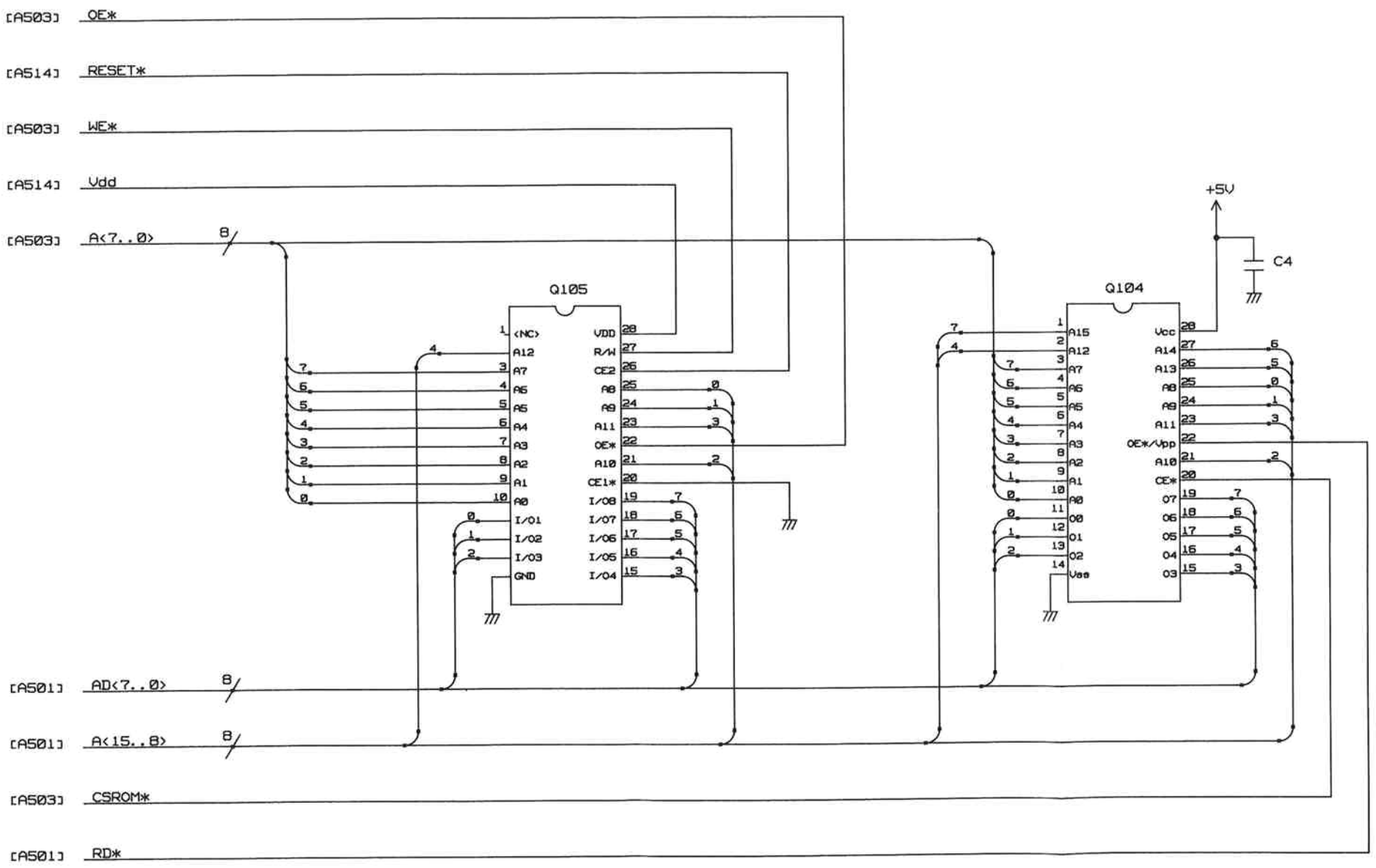

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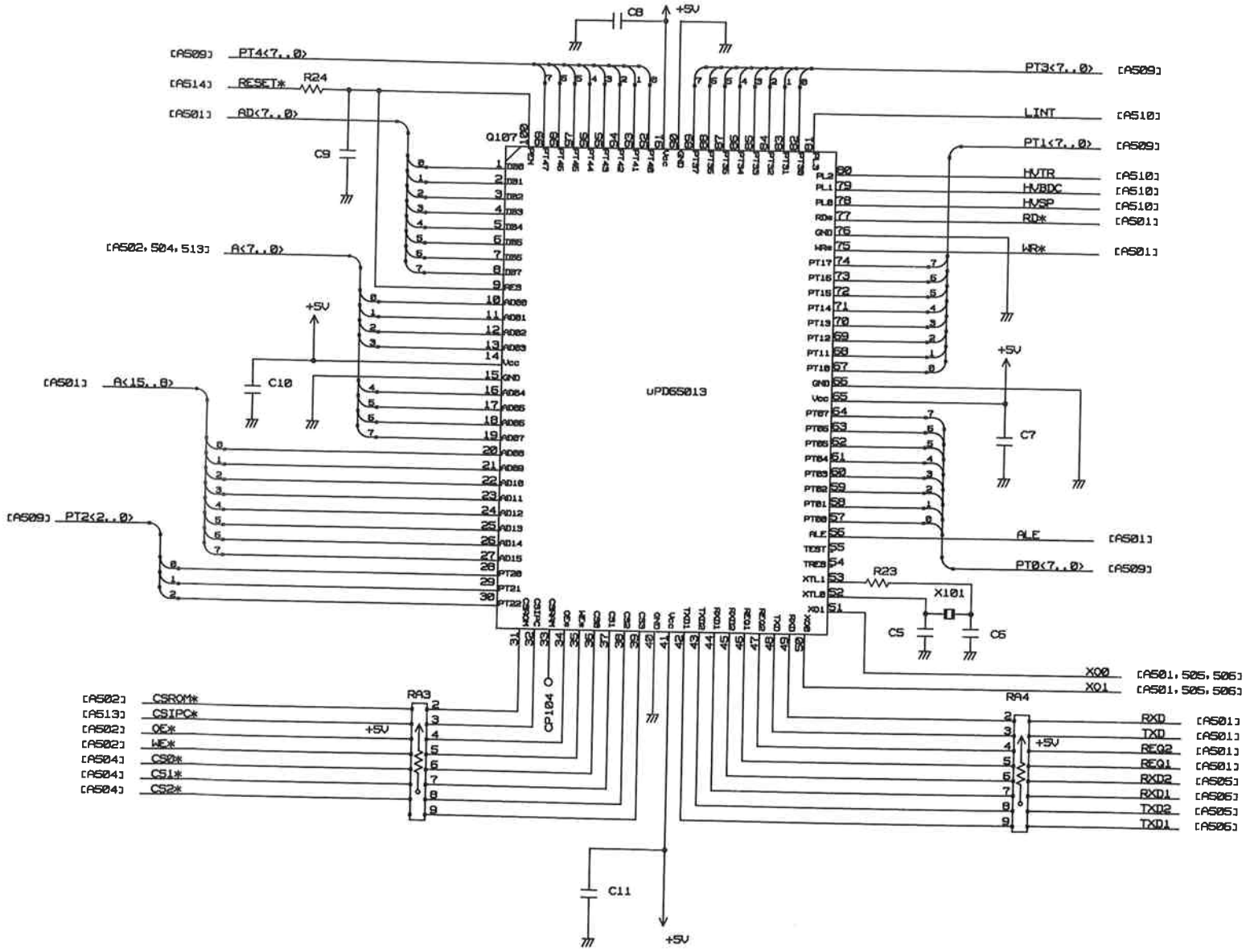

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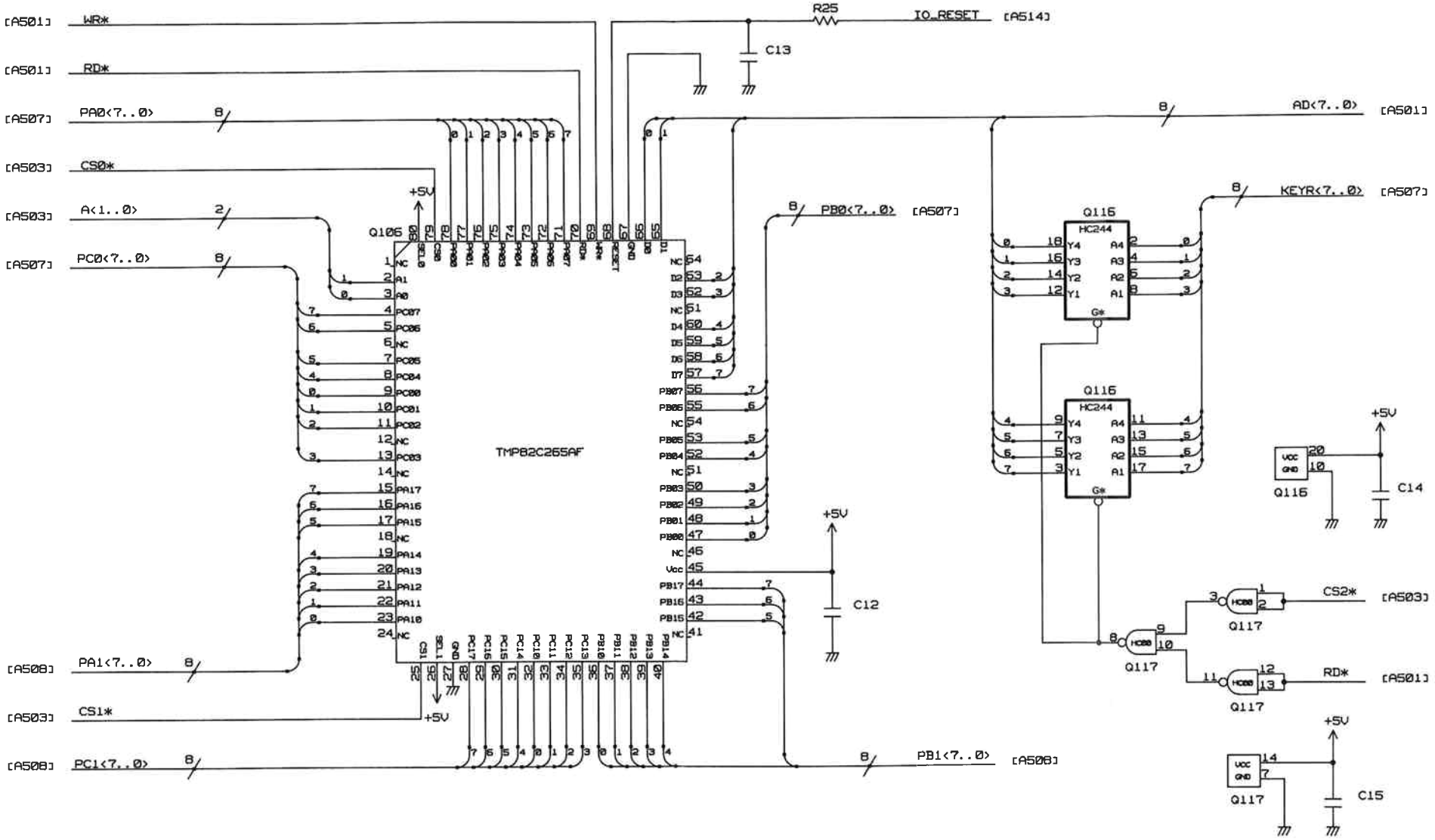

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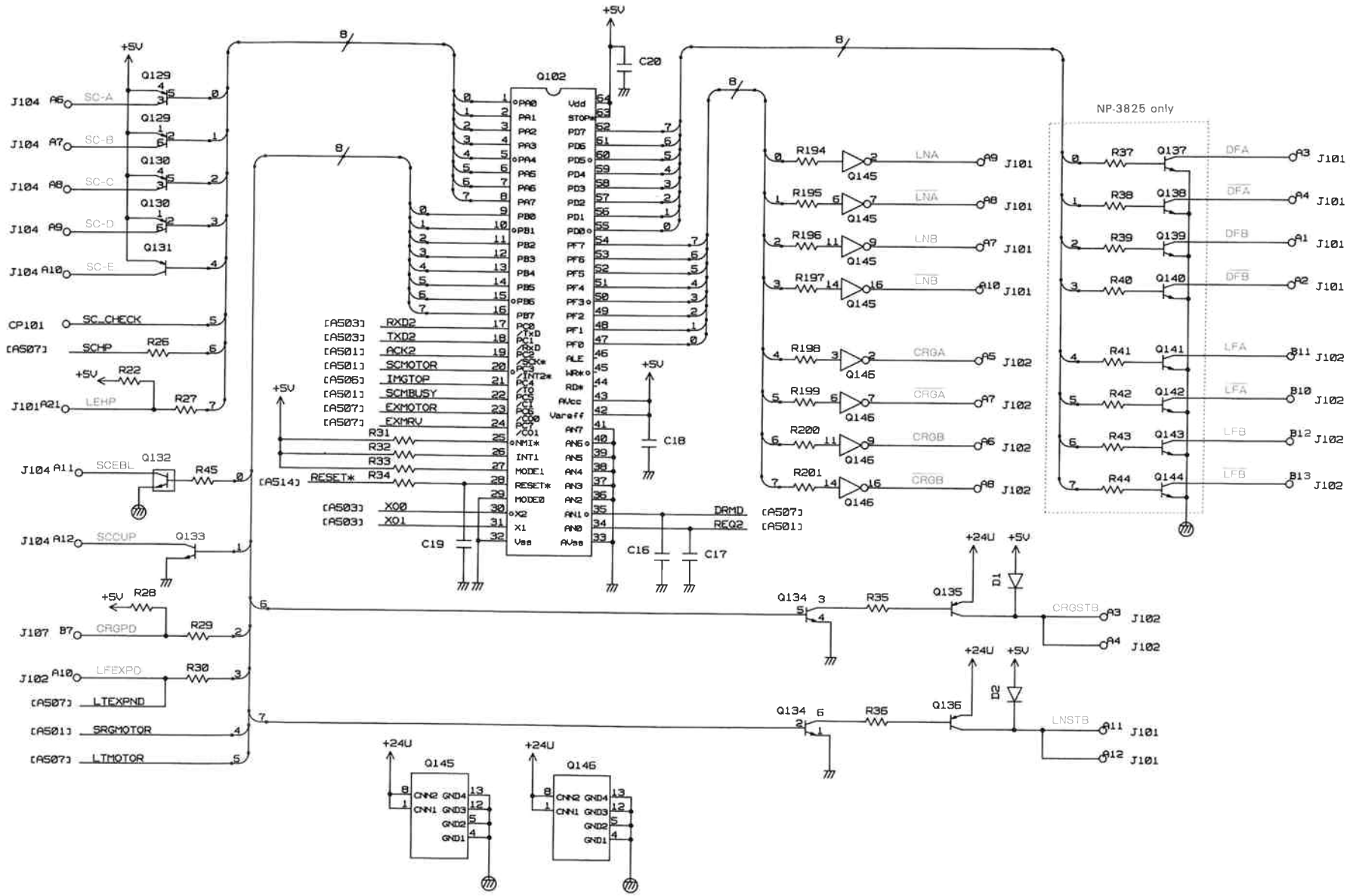

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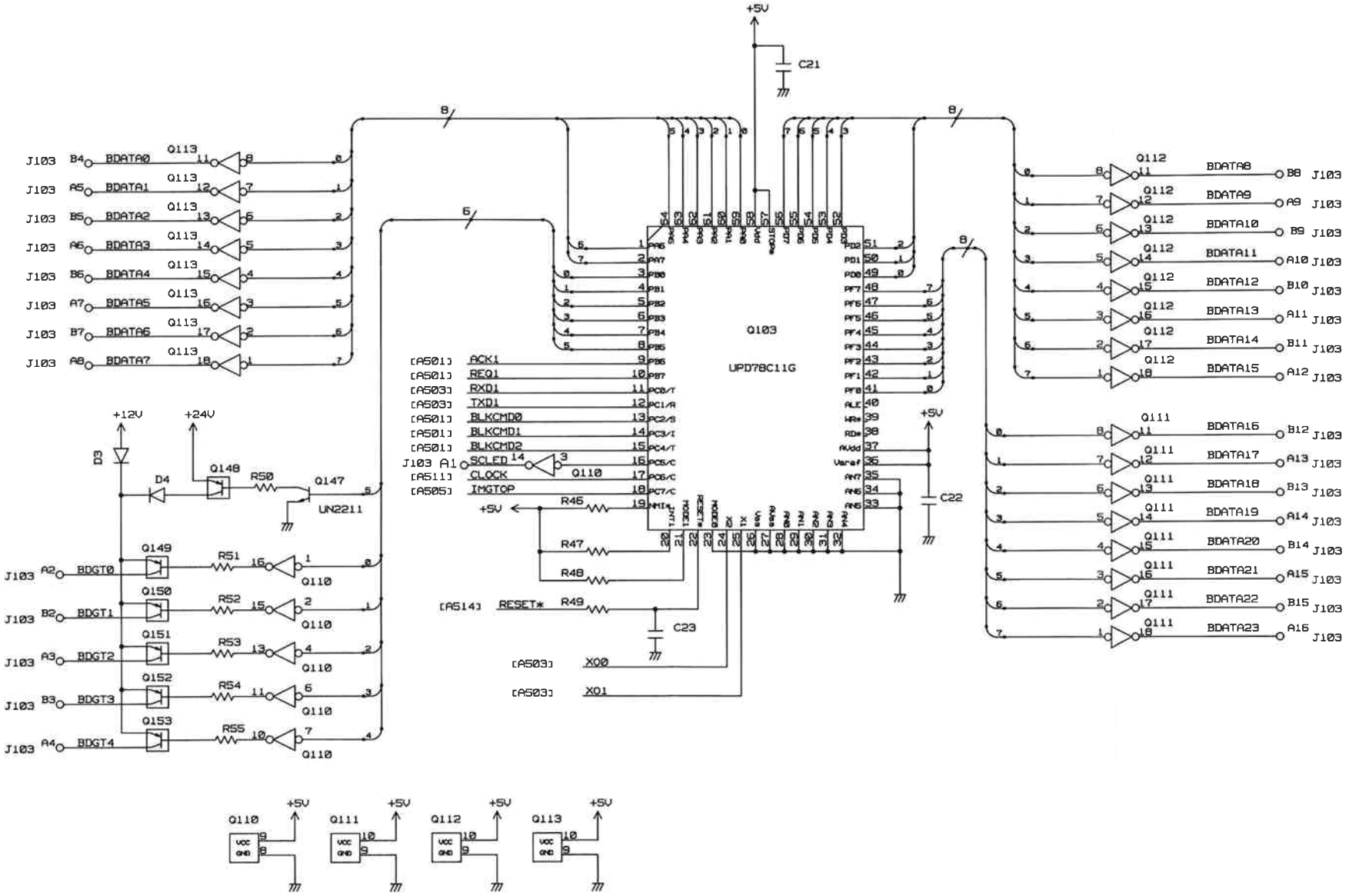

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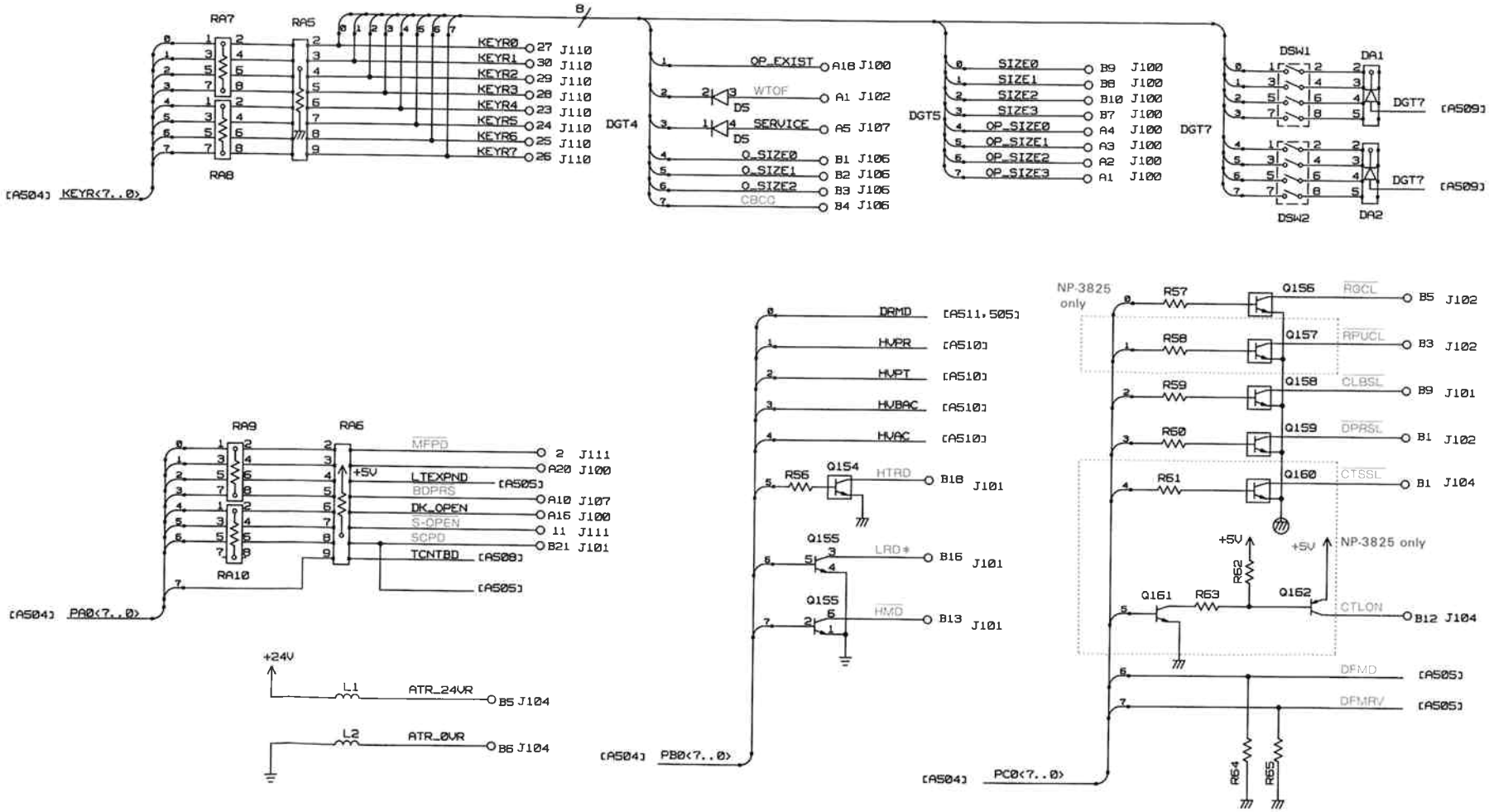

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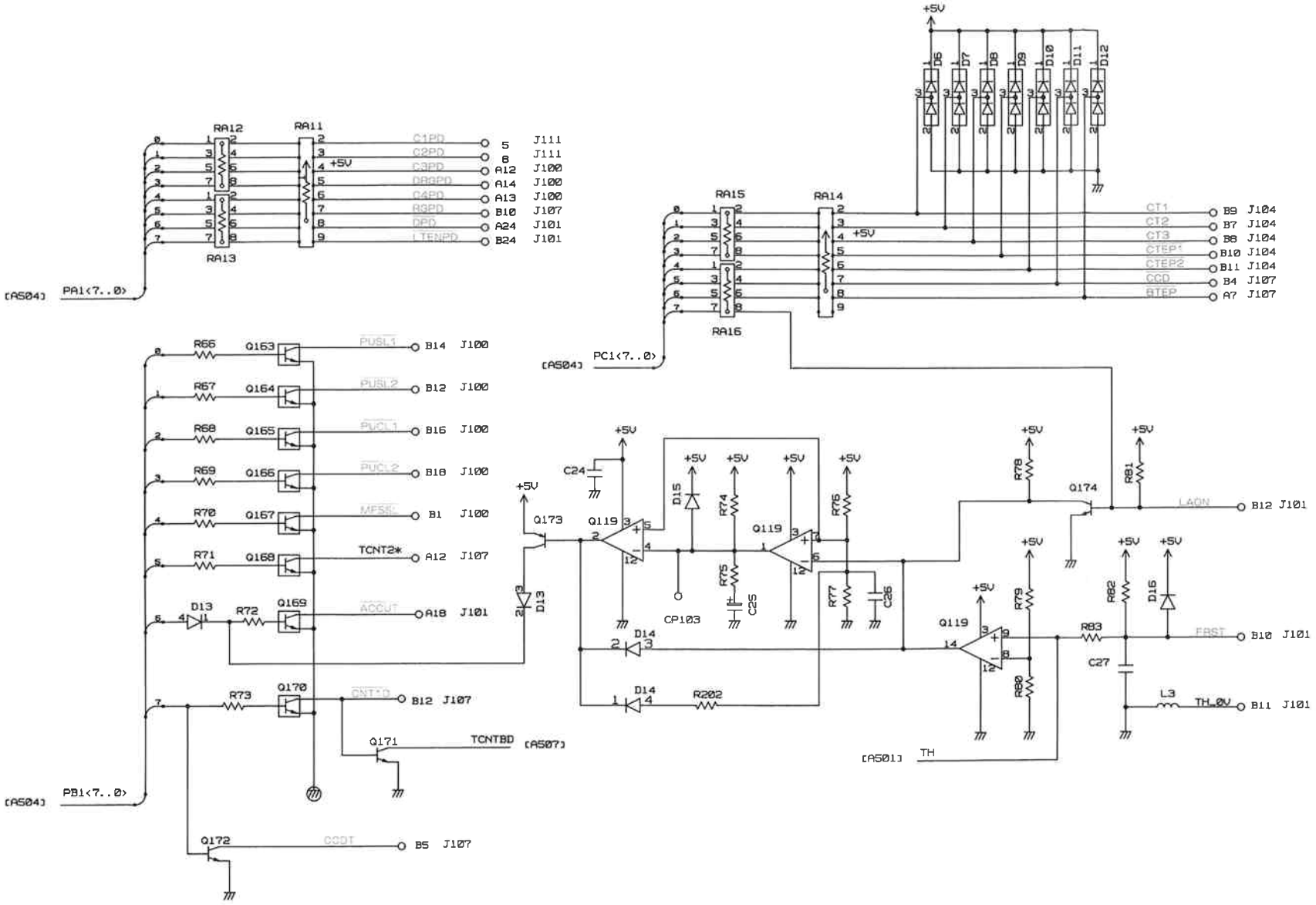

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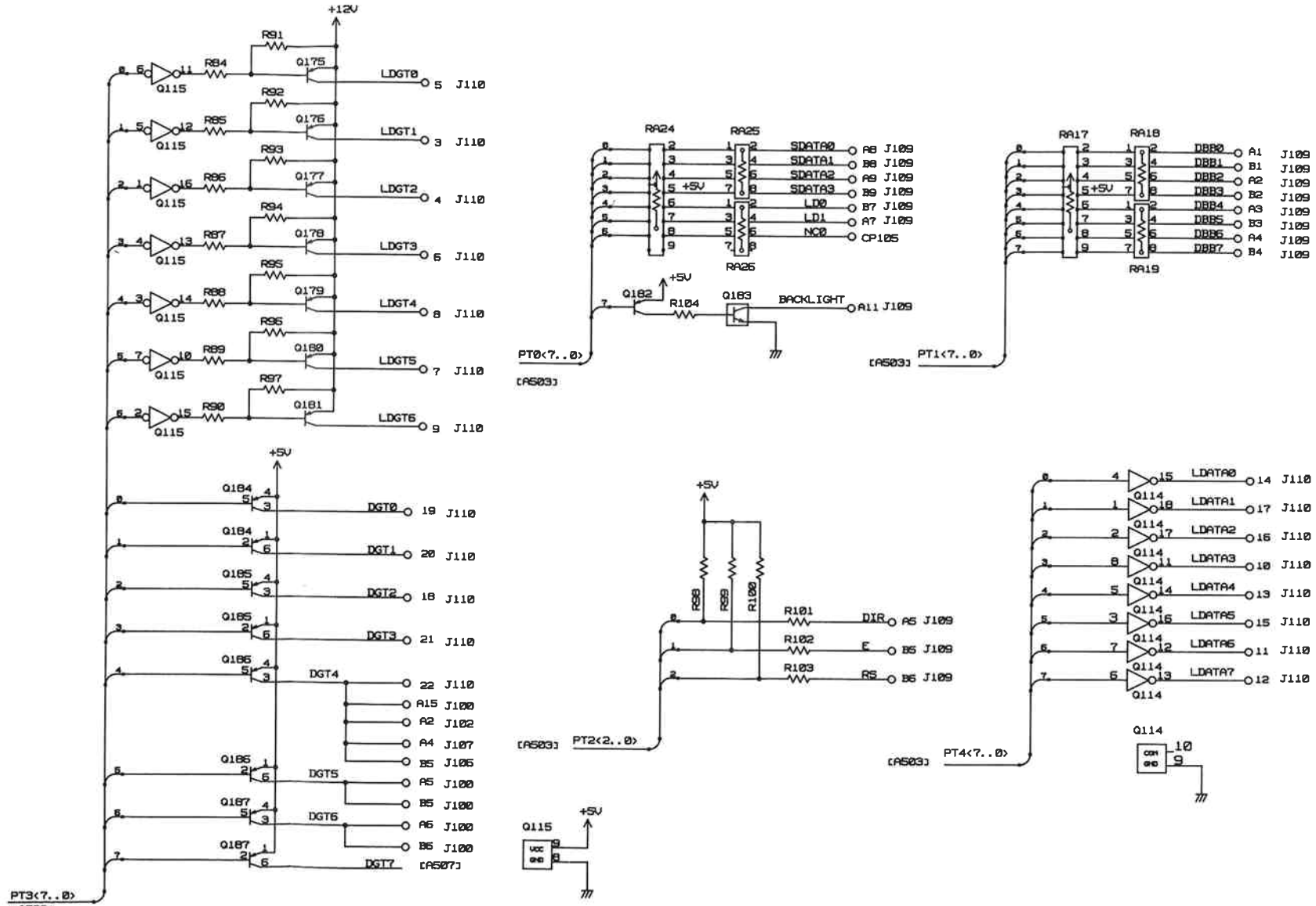

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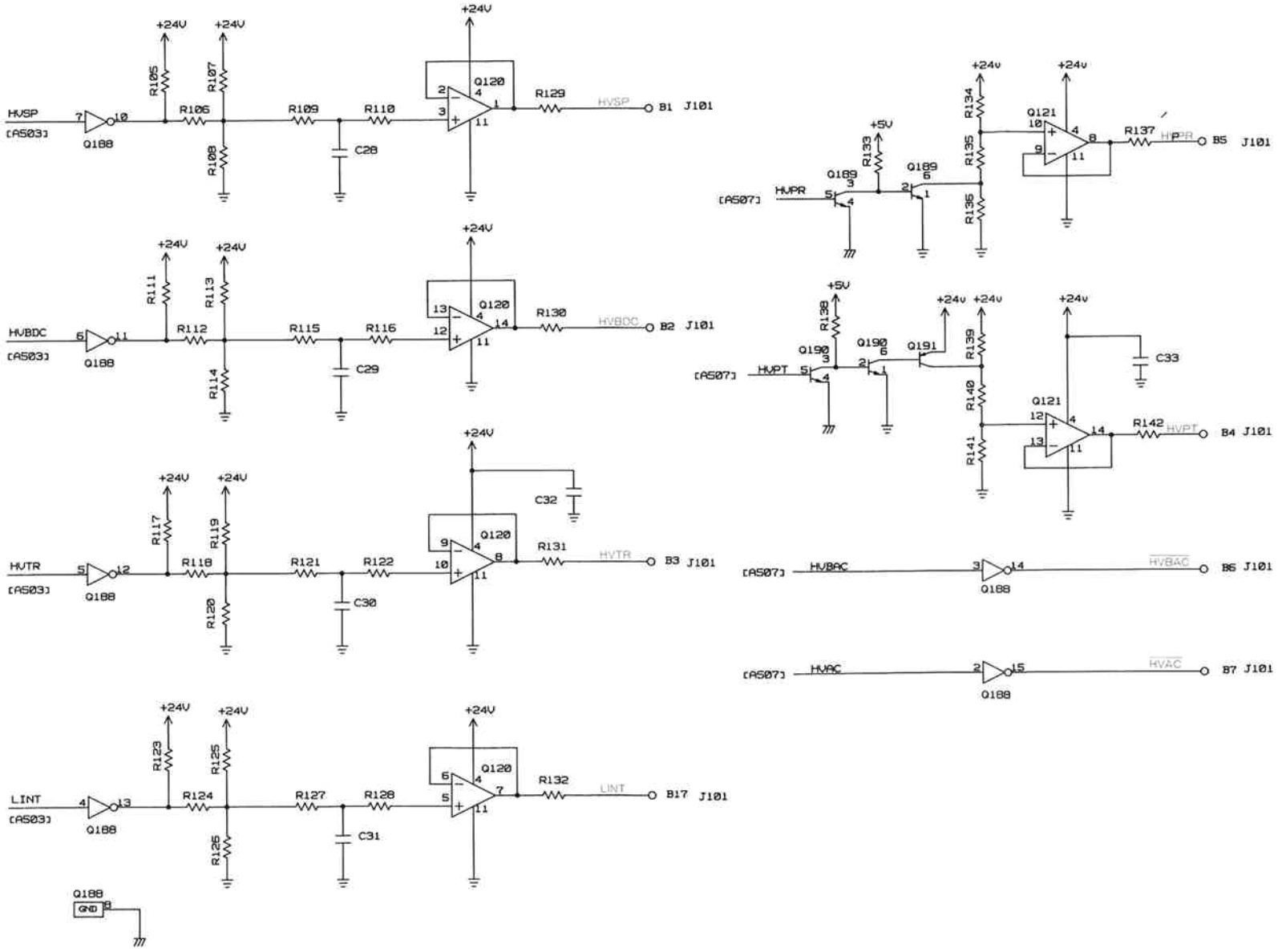

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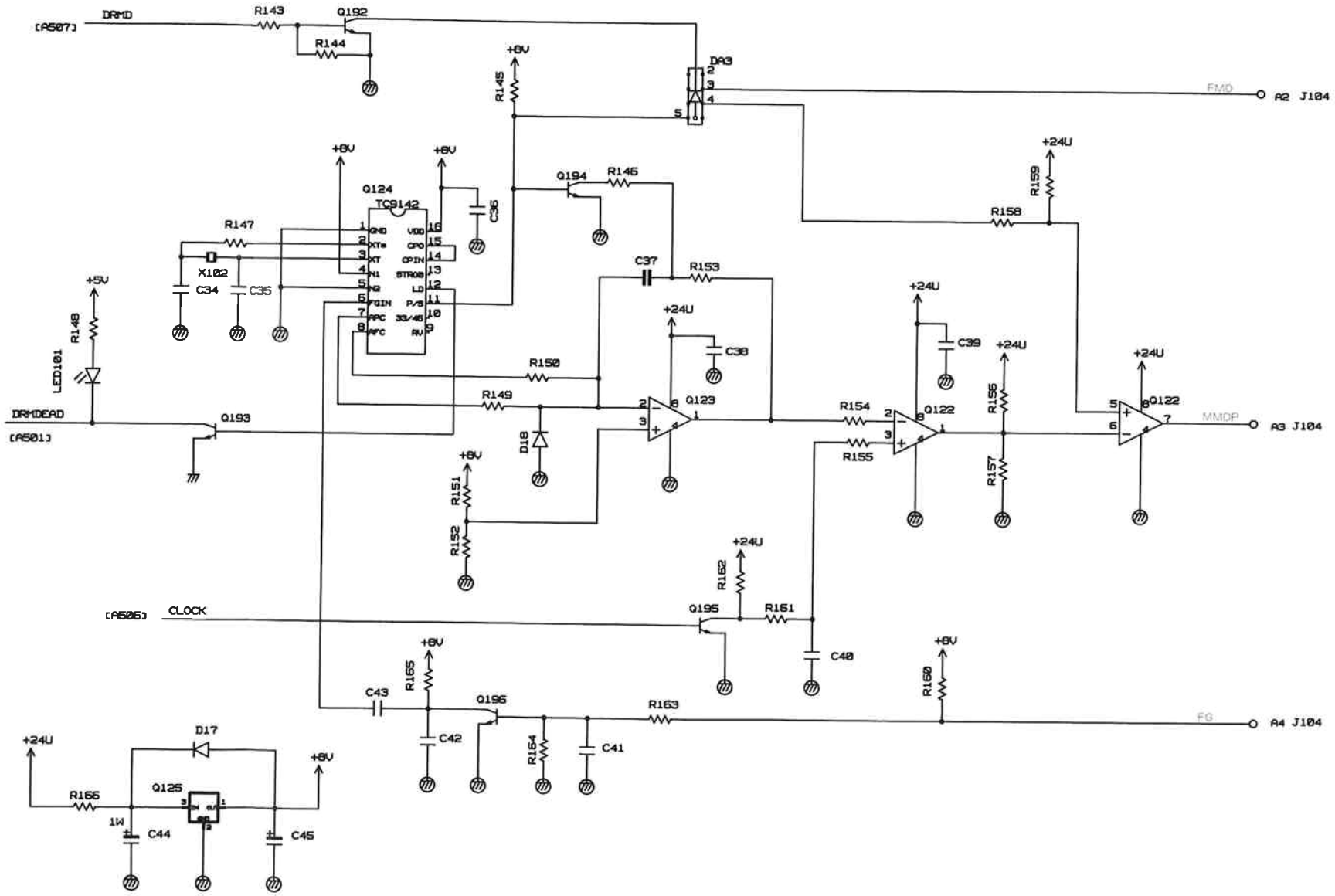

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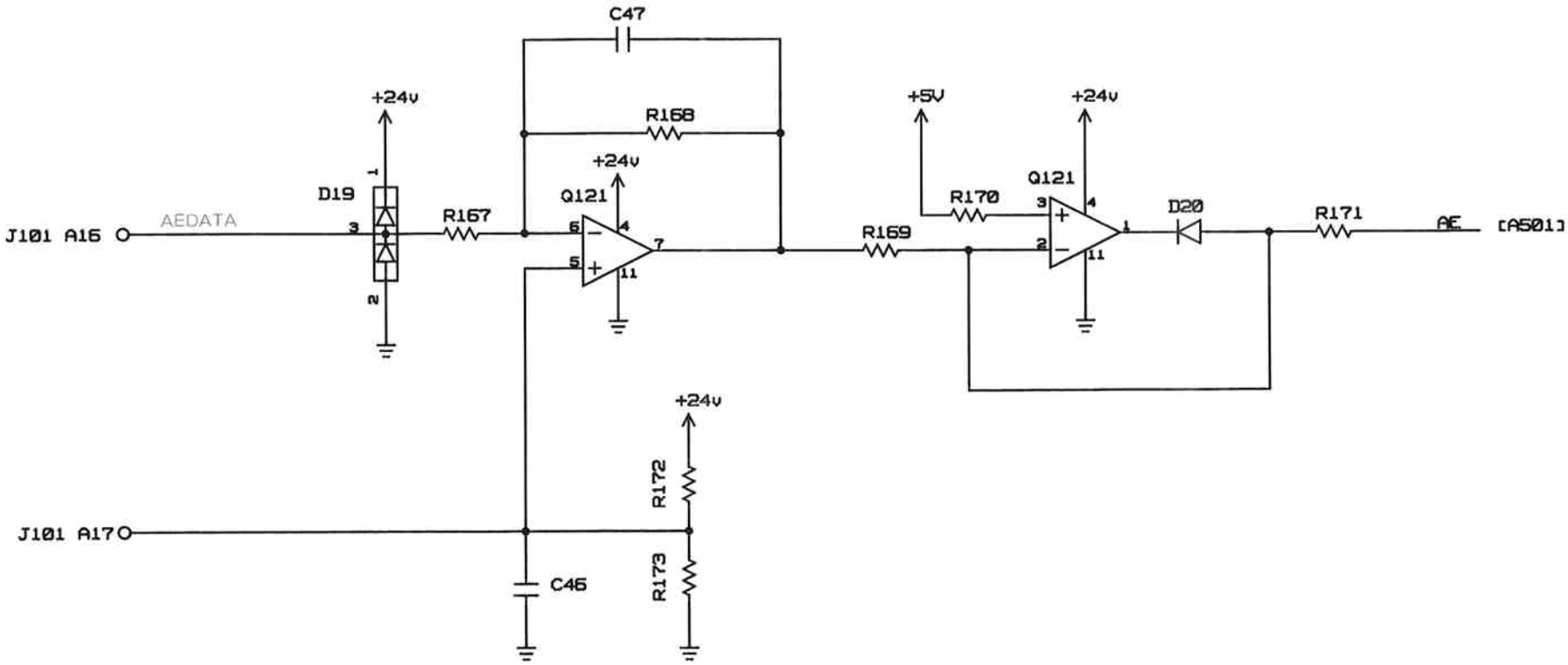

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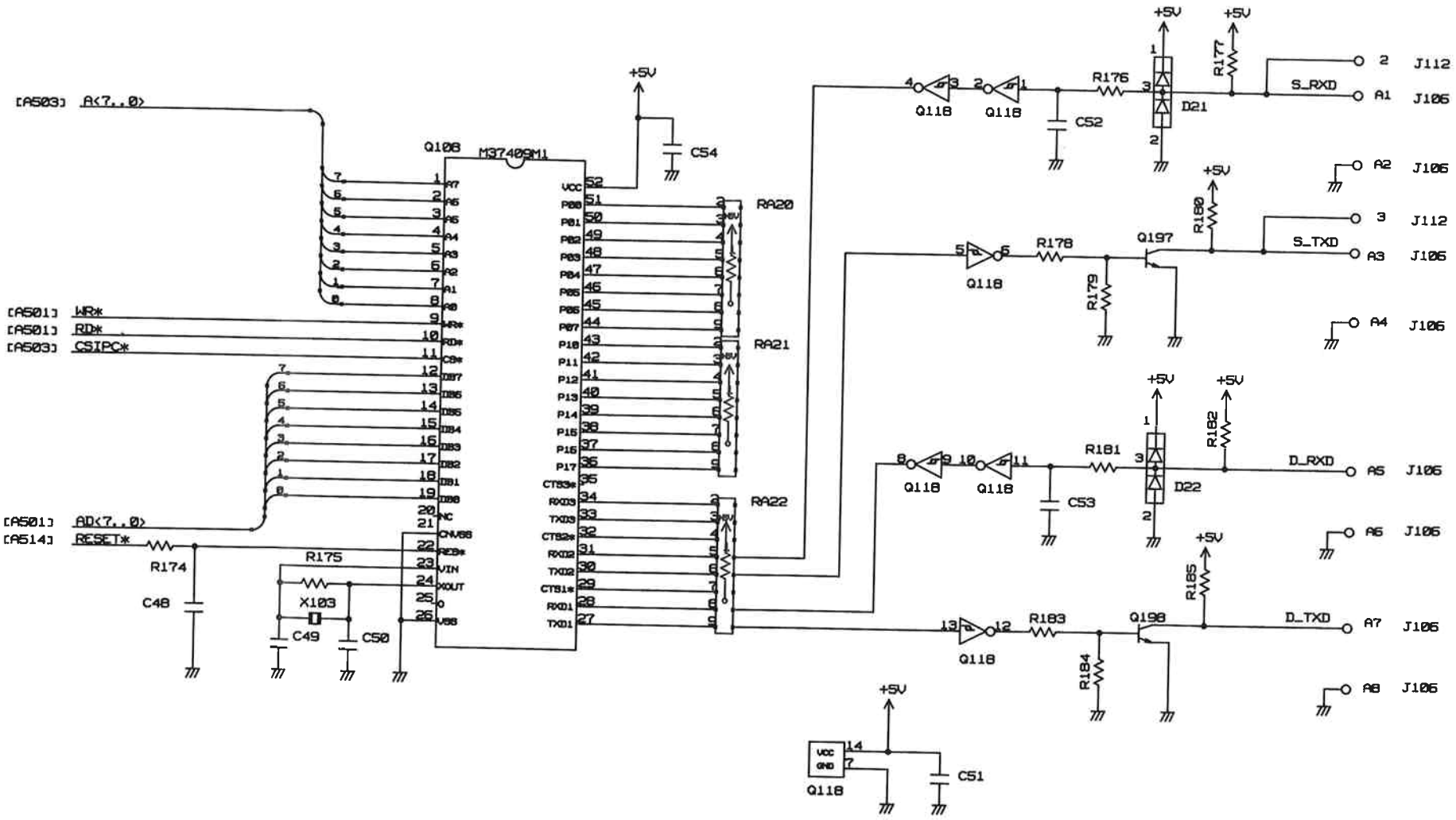

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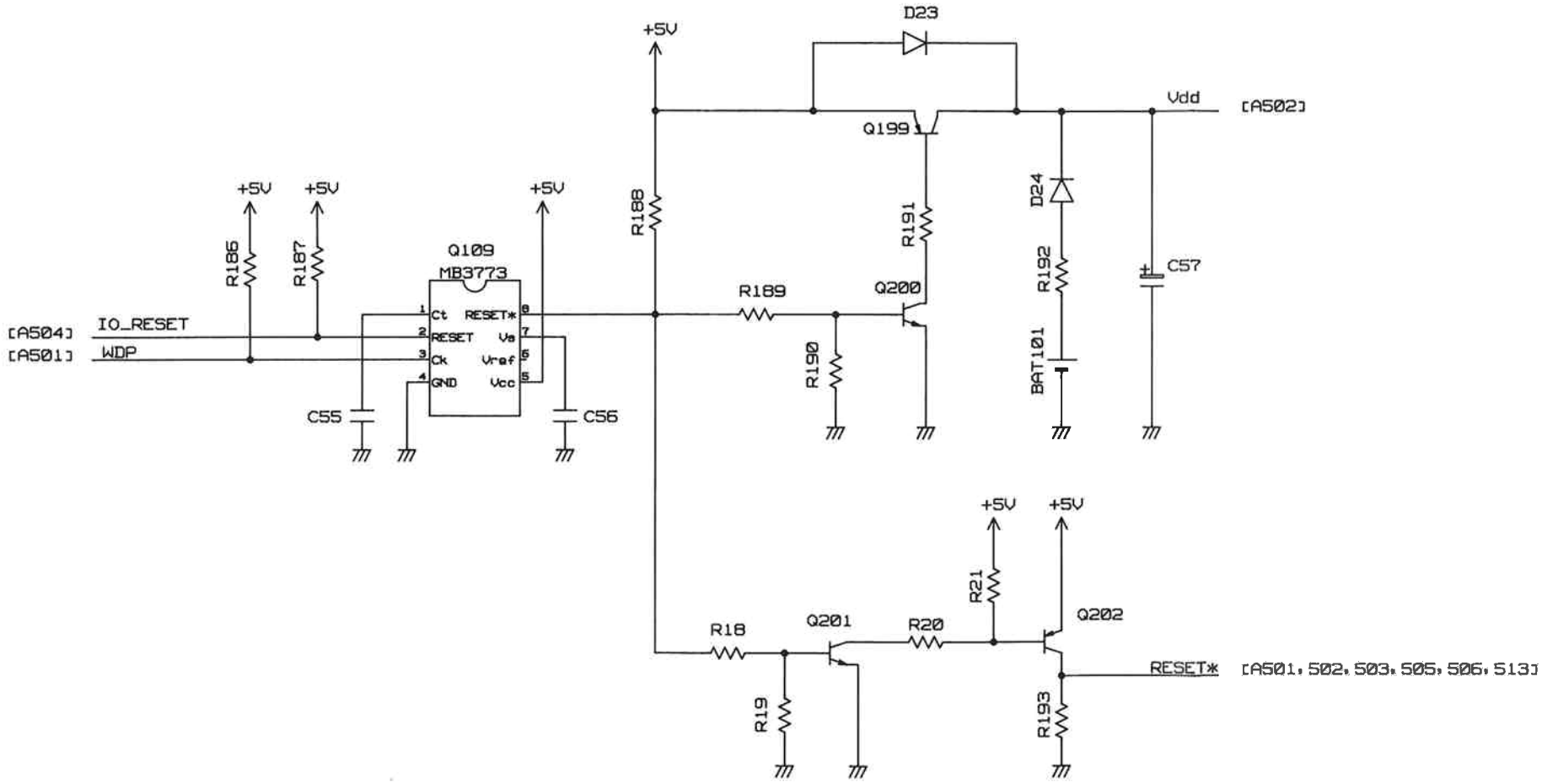

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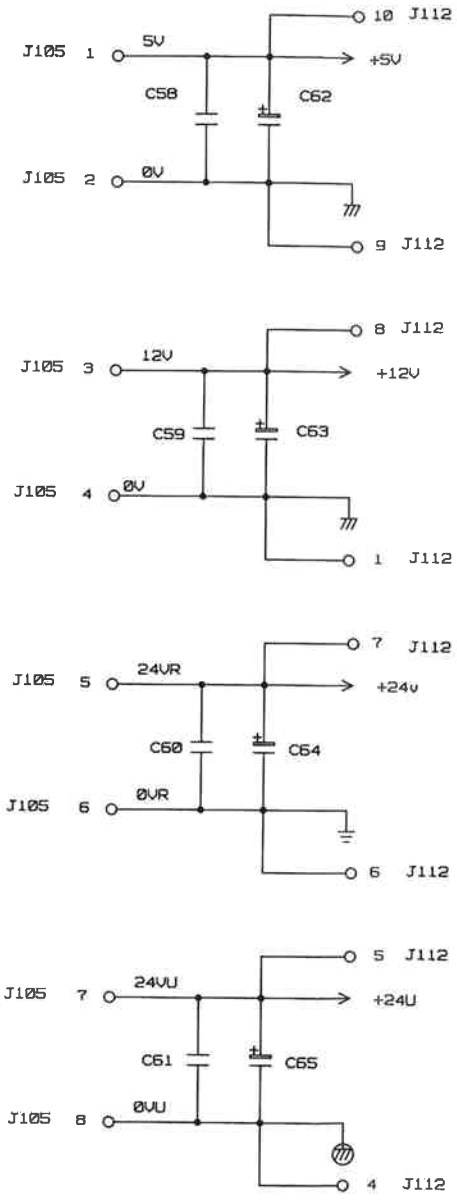

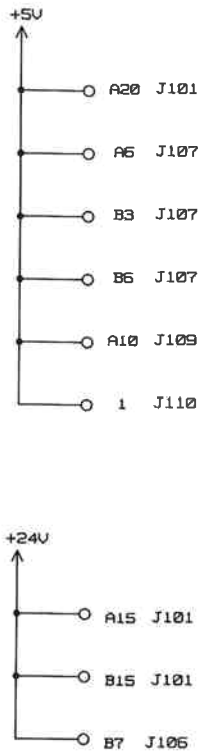

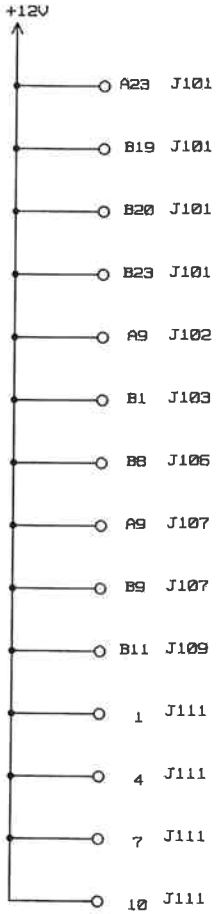

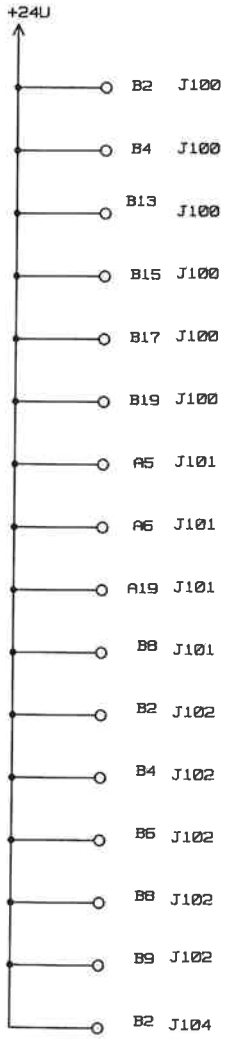

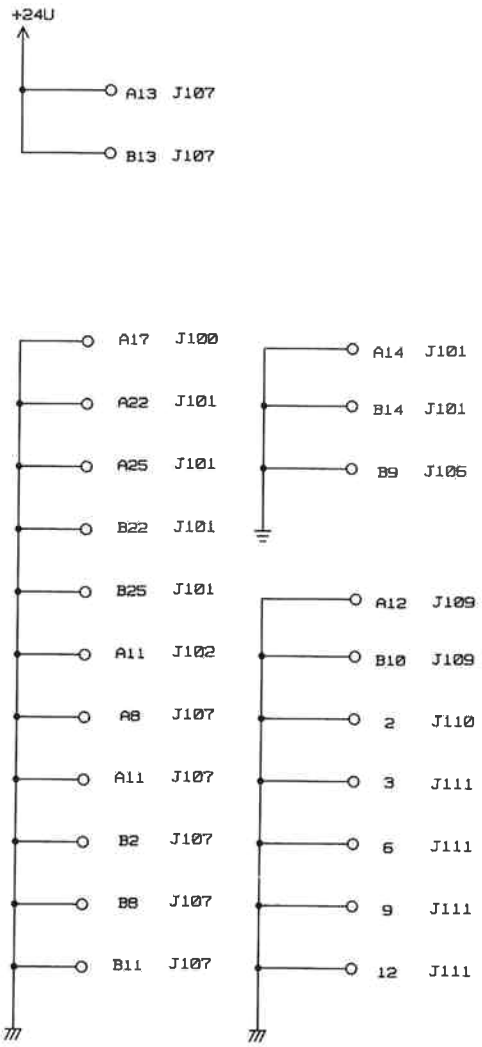

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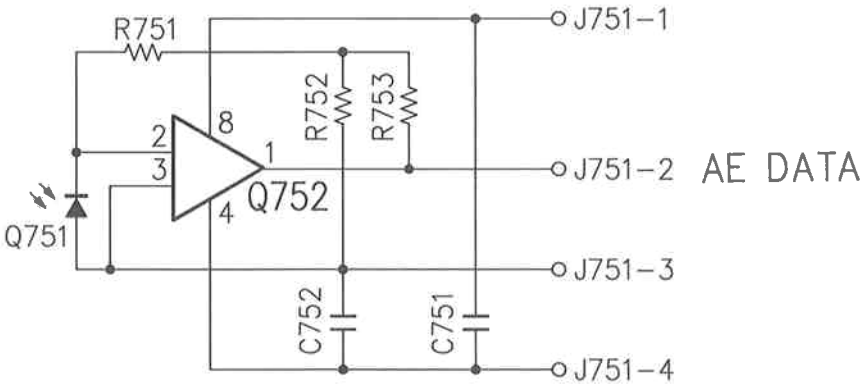
E. AE SENSOR



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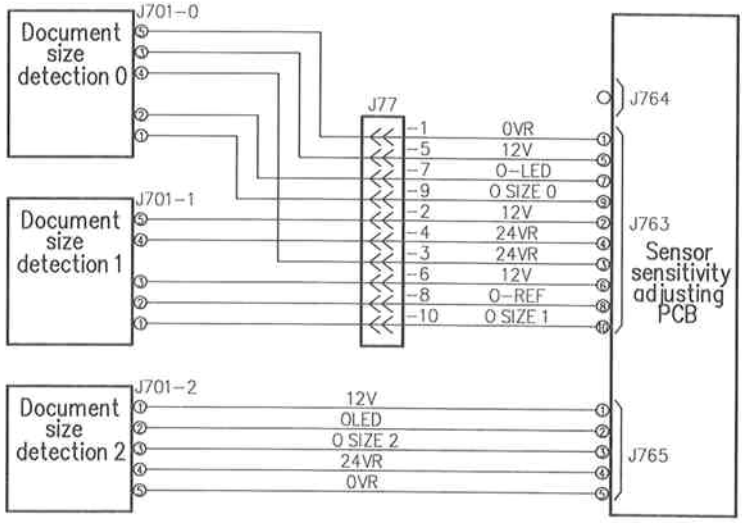
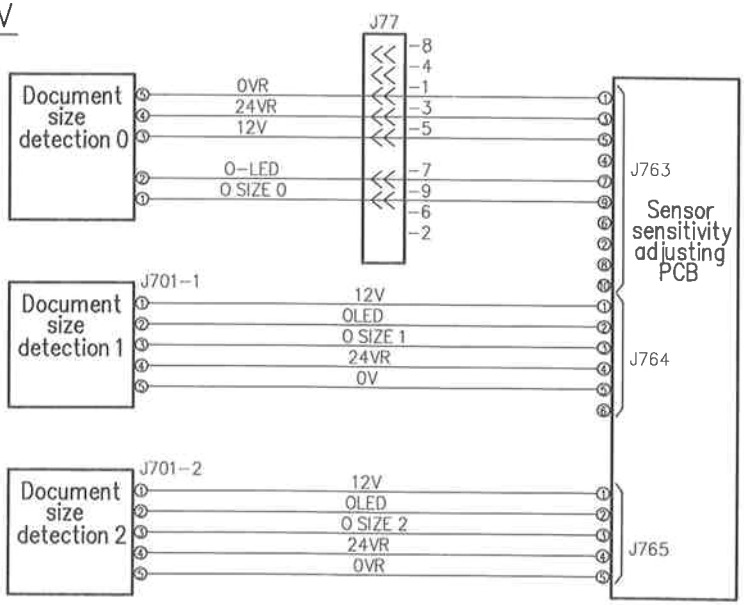
F. DOCUMENT SENSORS WIRING

100V,220/240V



115V



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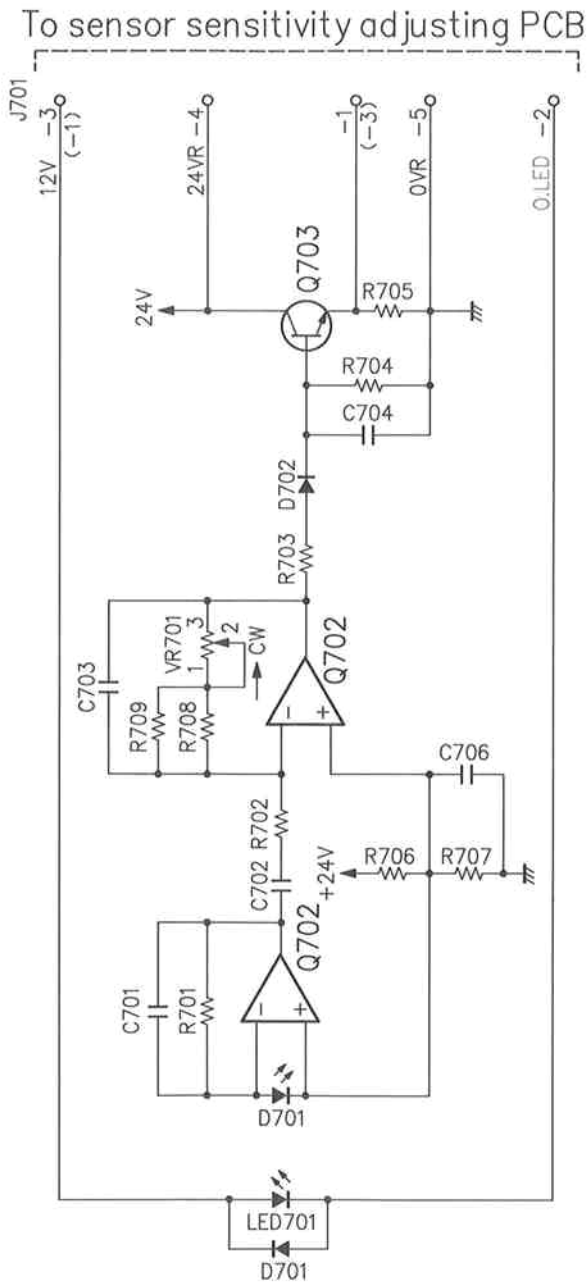
G. DOCUMENT SIZE SENSOR



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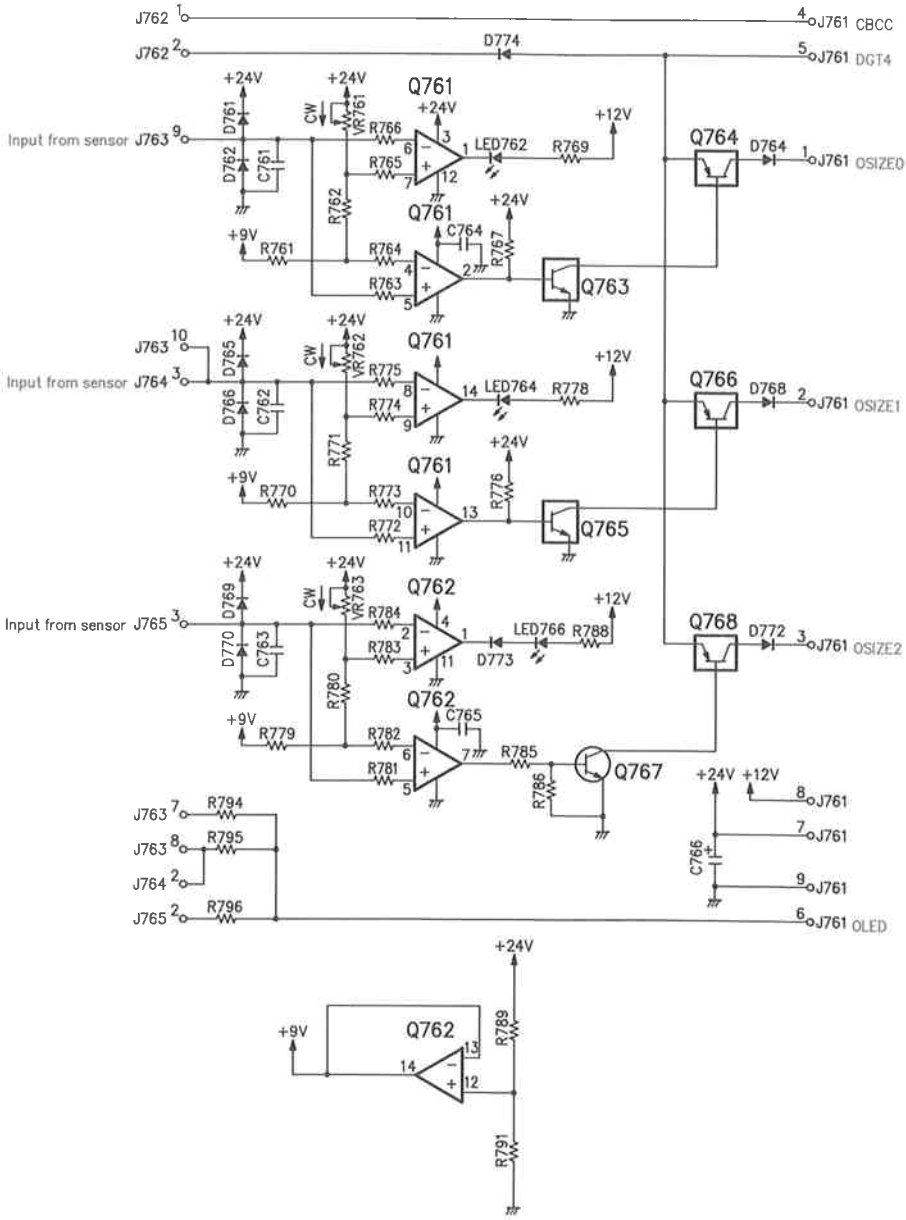
H. SENSOR SENSITIVITY ADJUSTING PCB



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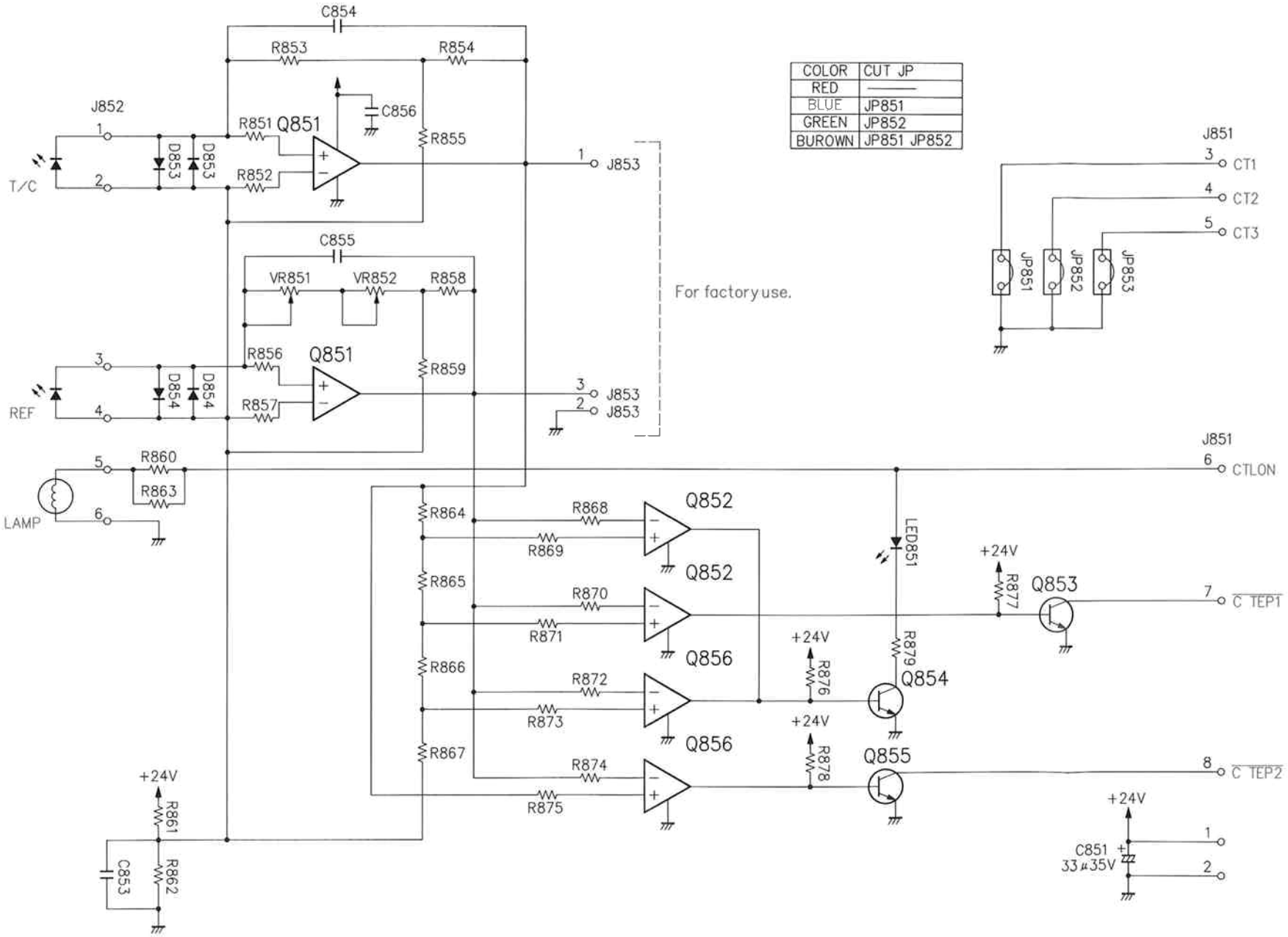
I. COLOR TONER CONCENTRATION DETECTION



COLOR	CUT JP
RED	——
BLUE	JP851
GREEN	JP852
BUROWN	JP851 JP852

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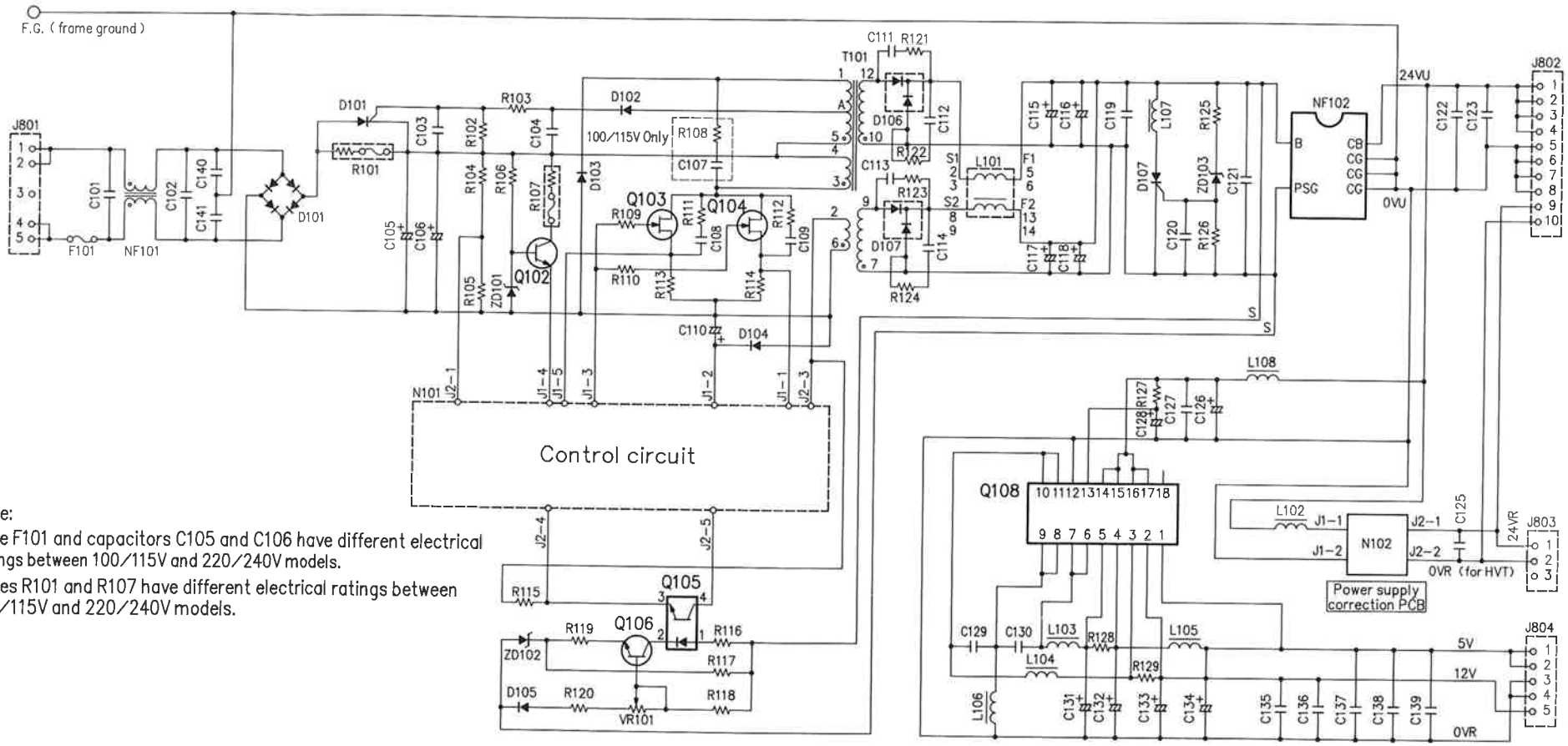

Note:

Fuse F101 and capacitors C105 and C106 have different electrical ratings between 100/115V and 220/240V models.

Fuses R101 and R107 have different electrical ratings between 100/115V and 220/240V models.

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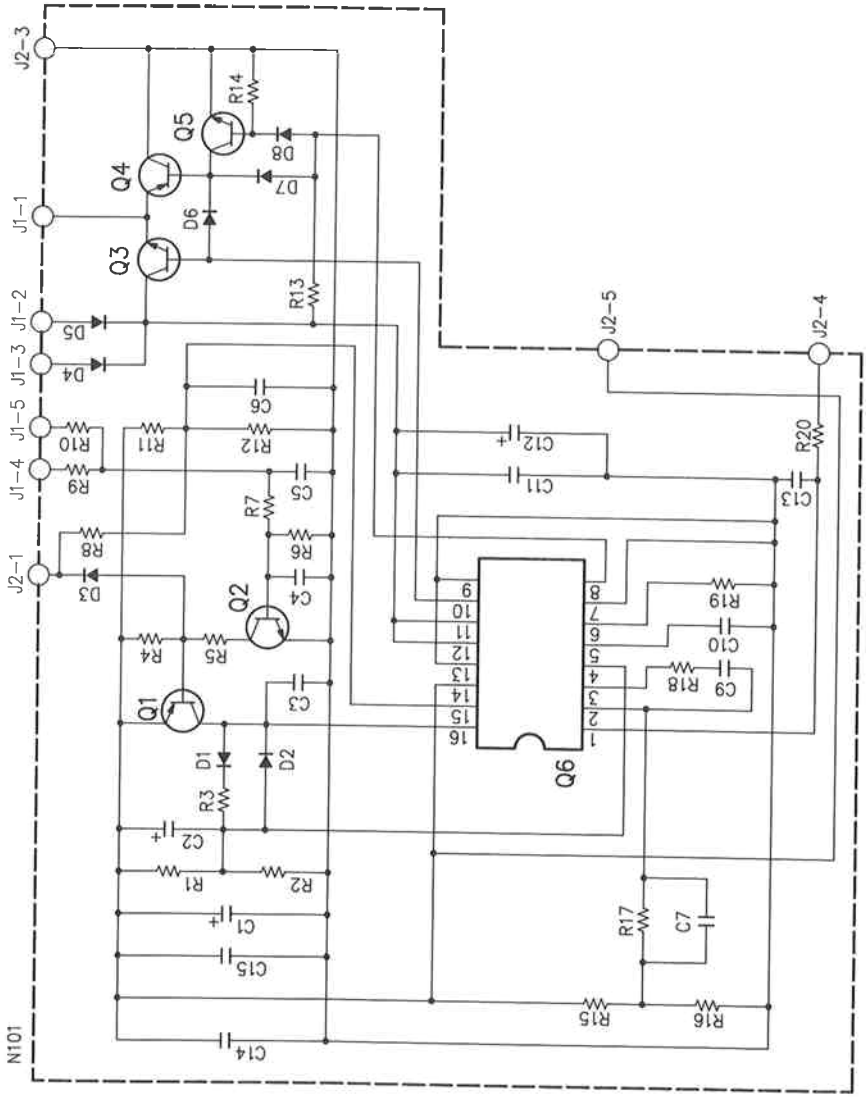
K. CONTROL CIRCUIT (DC POWER SUPPLY)



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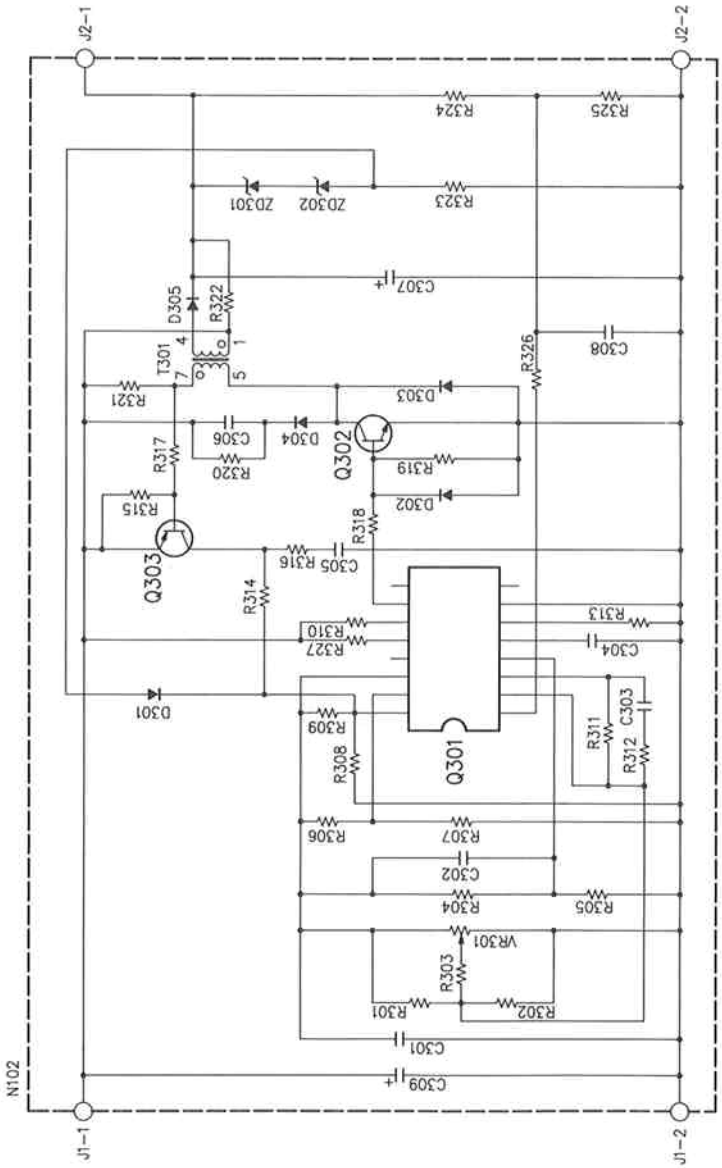
L. SUB CIRCUIT (DC POWER SUPPLY)



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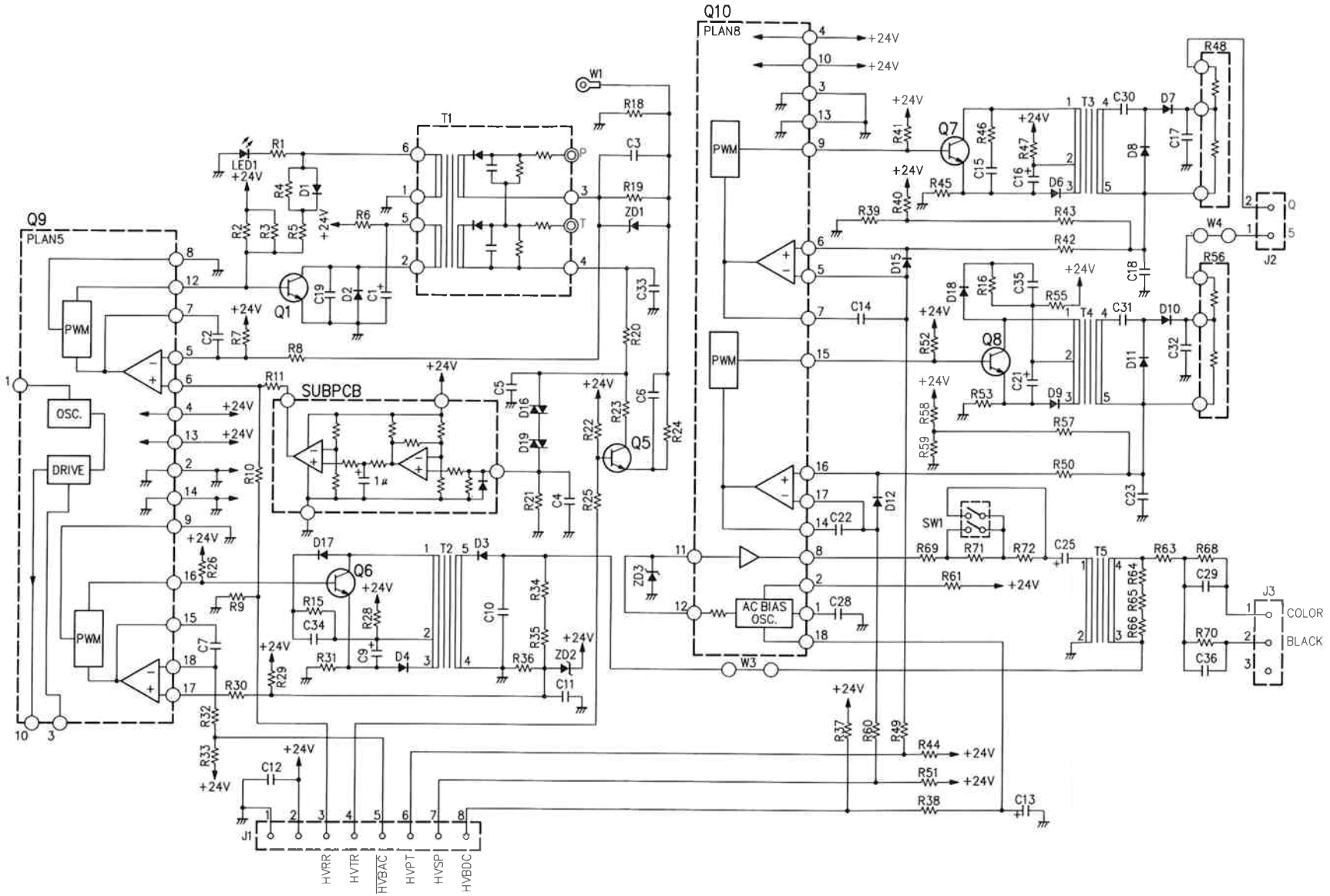

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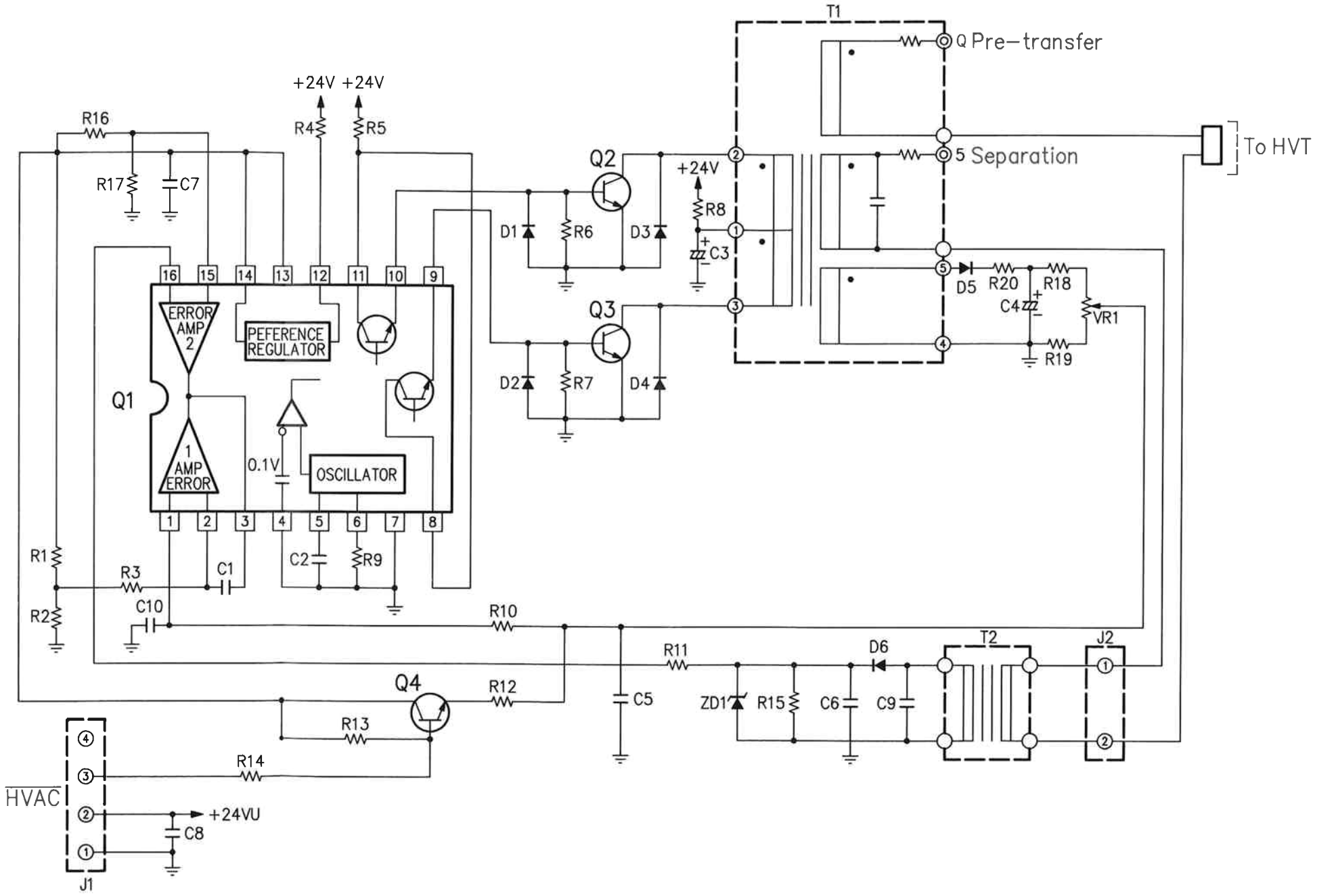

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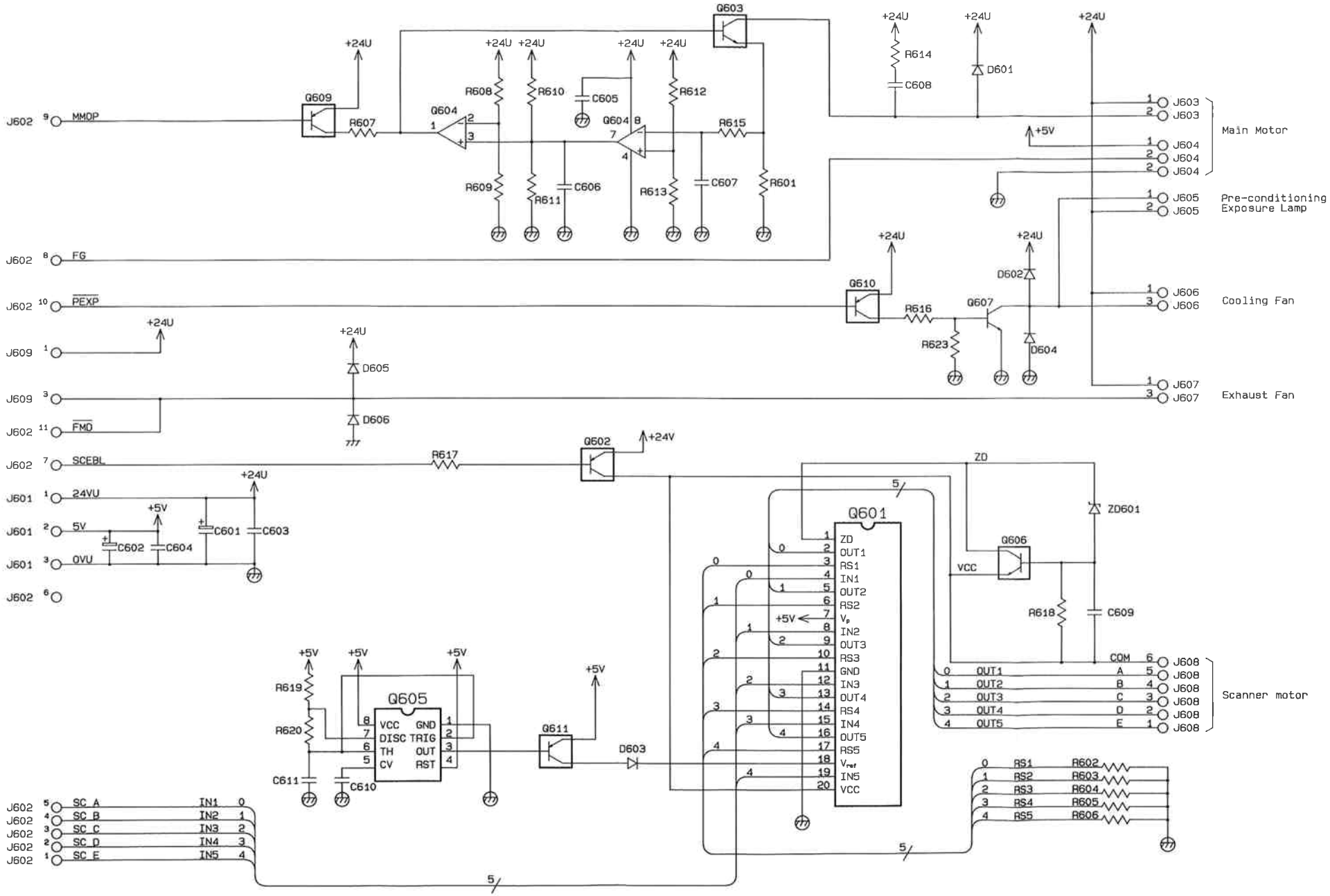

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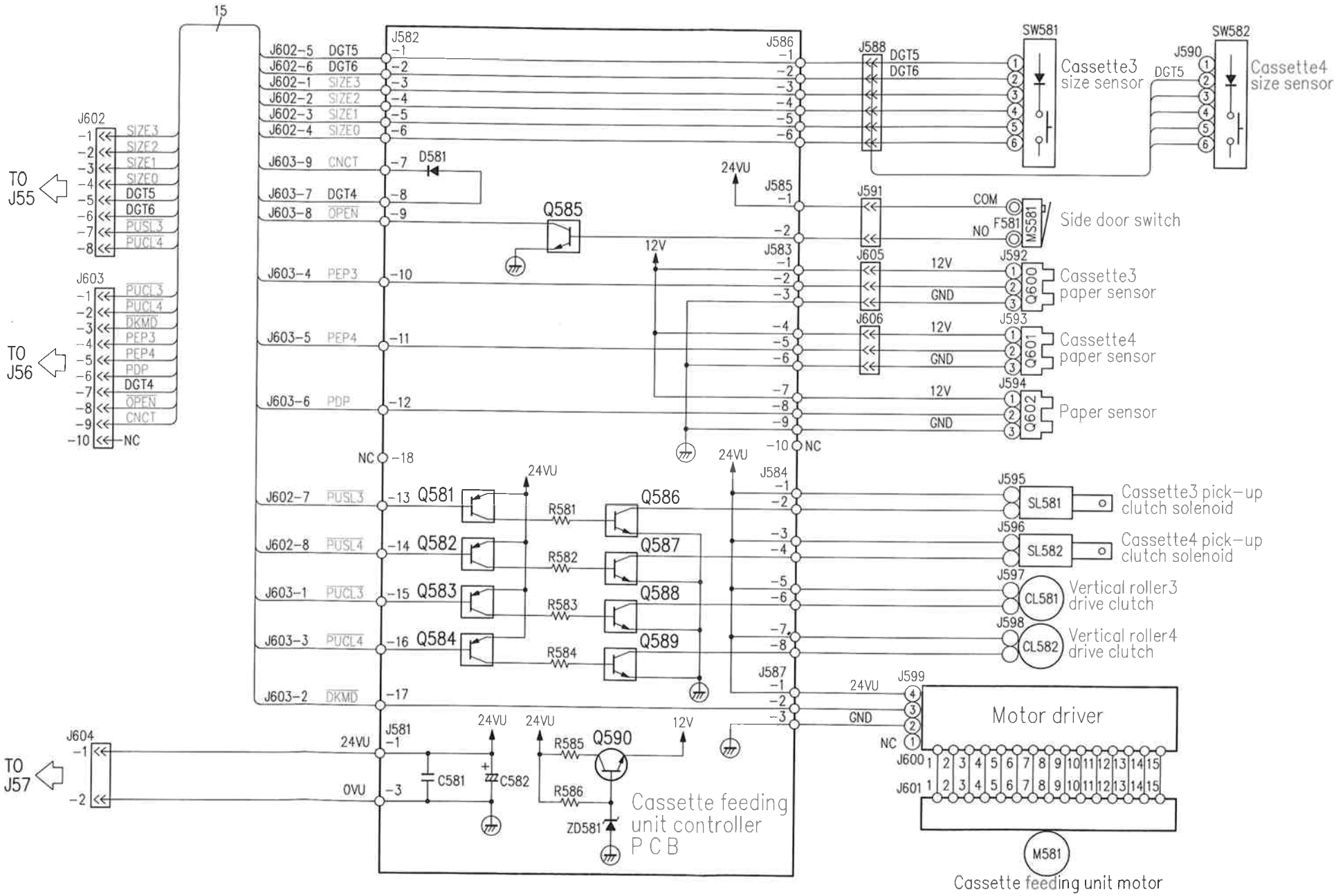

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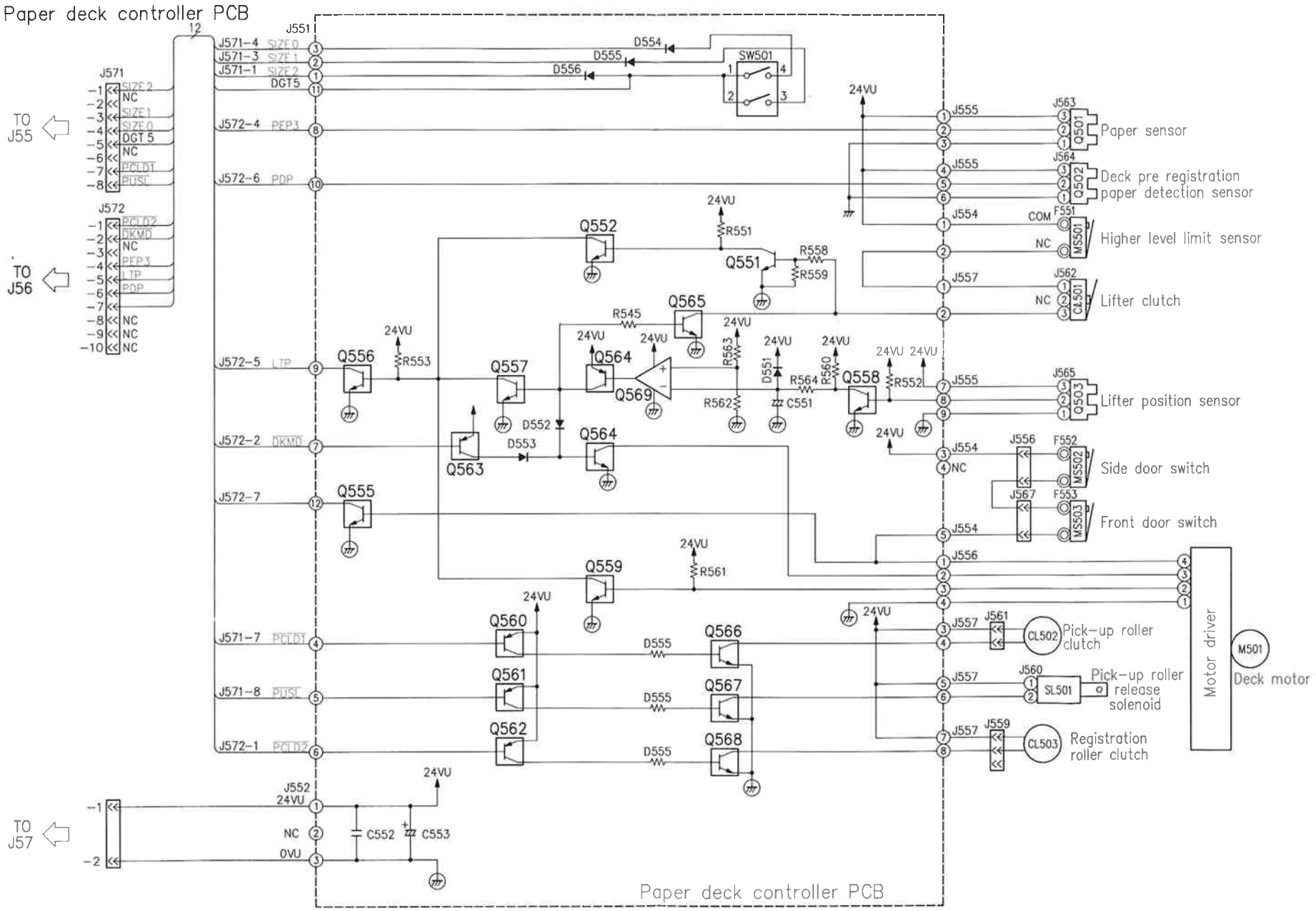

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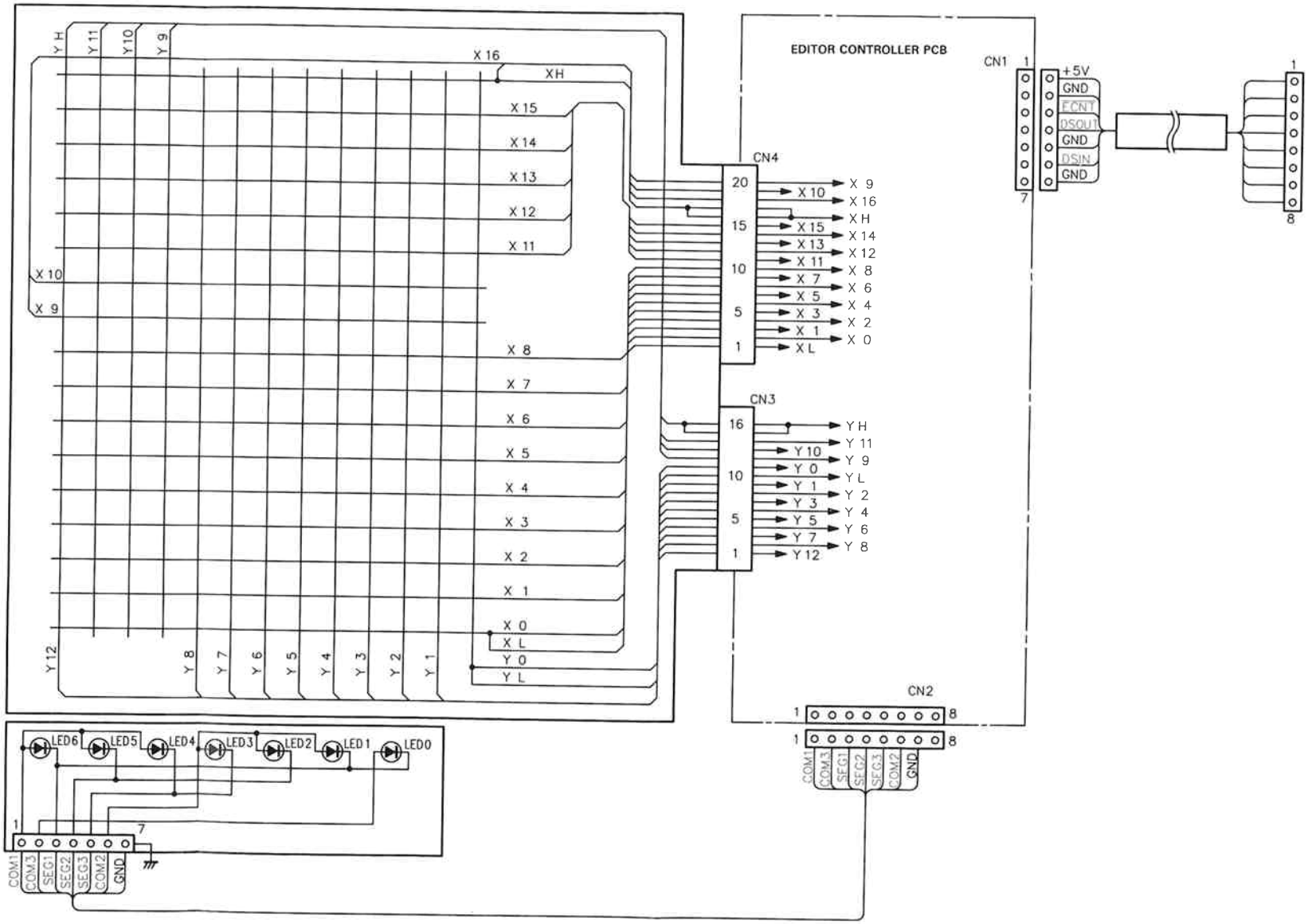
R. EDITOR GENERAL CIRCUIT DIAGRAM



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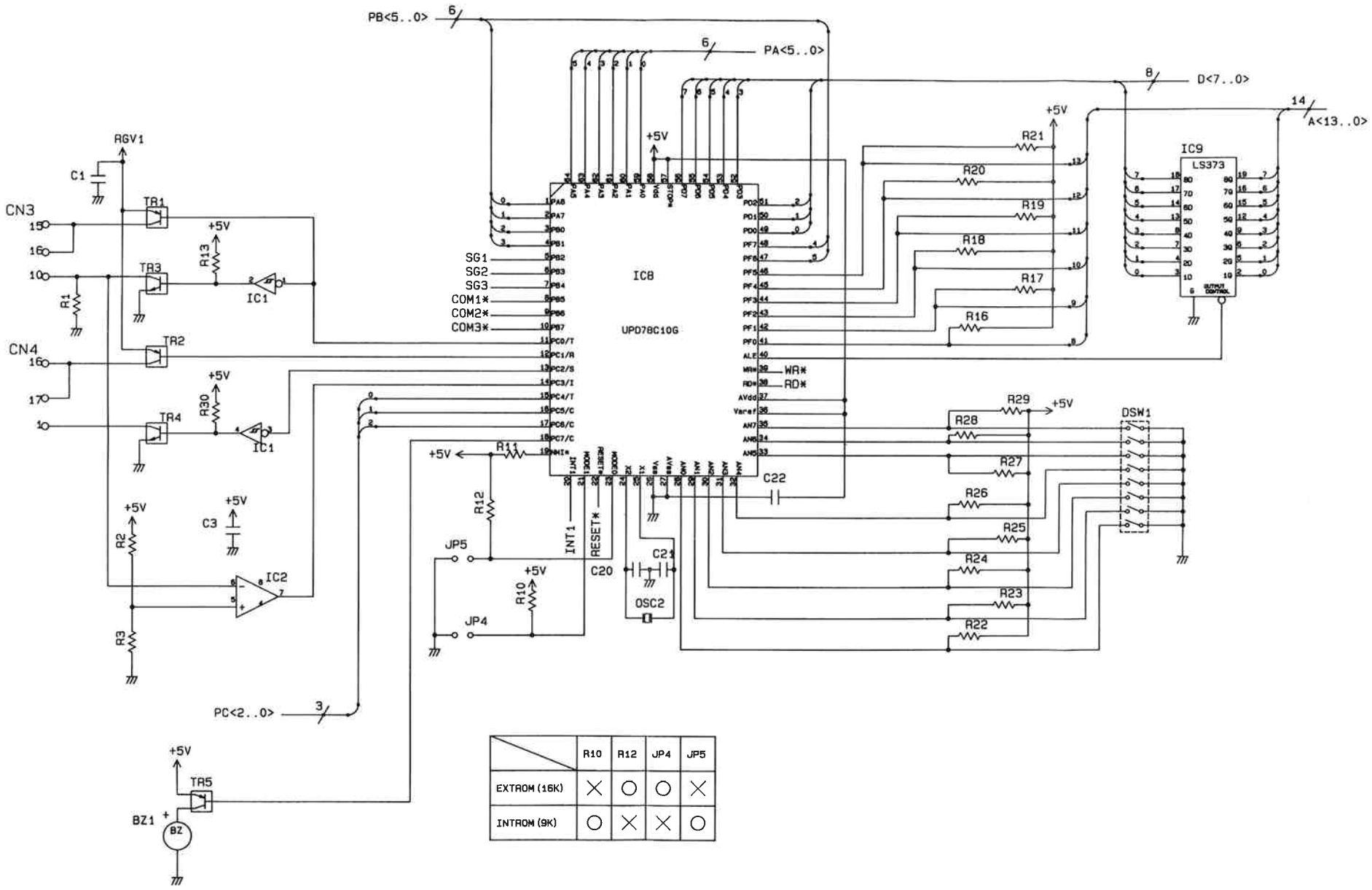

	R10	R12	JP4	JP5
EXTROM (16K)	X	O	O	X
INTROM (9K)	O	X	X	O

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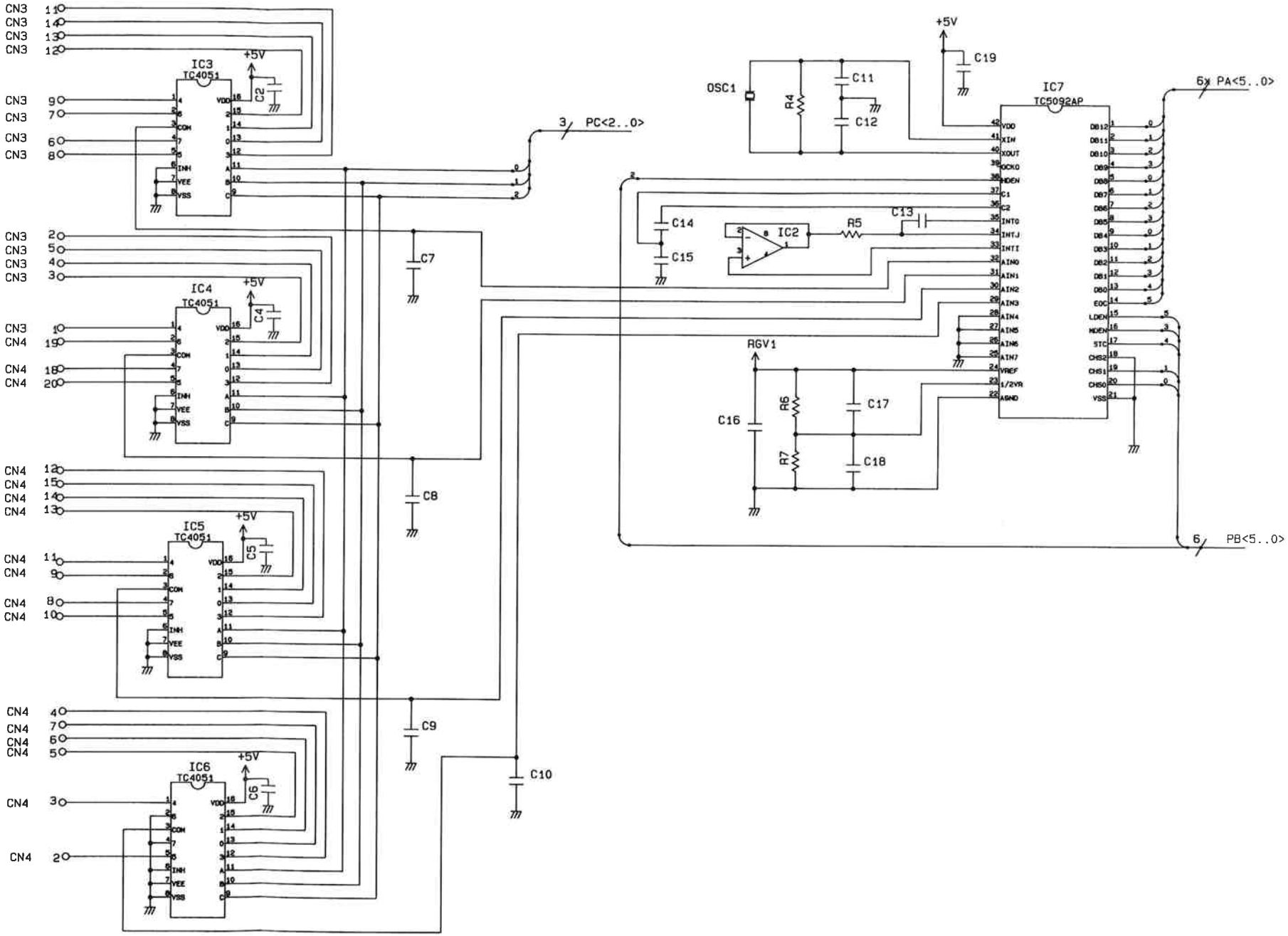
EDITOR CONTROLLER PCB (2/3)



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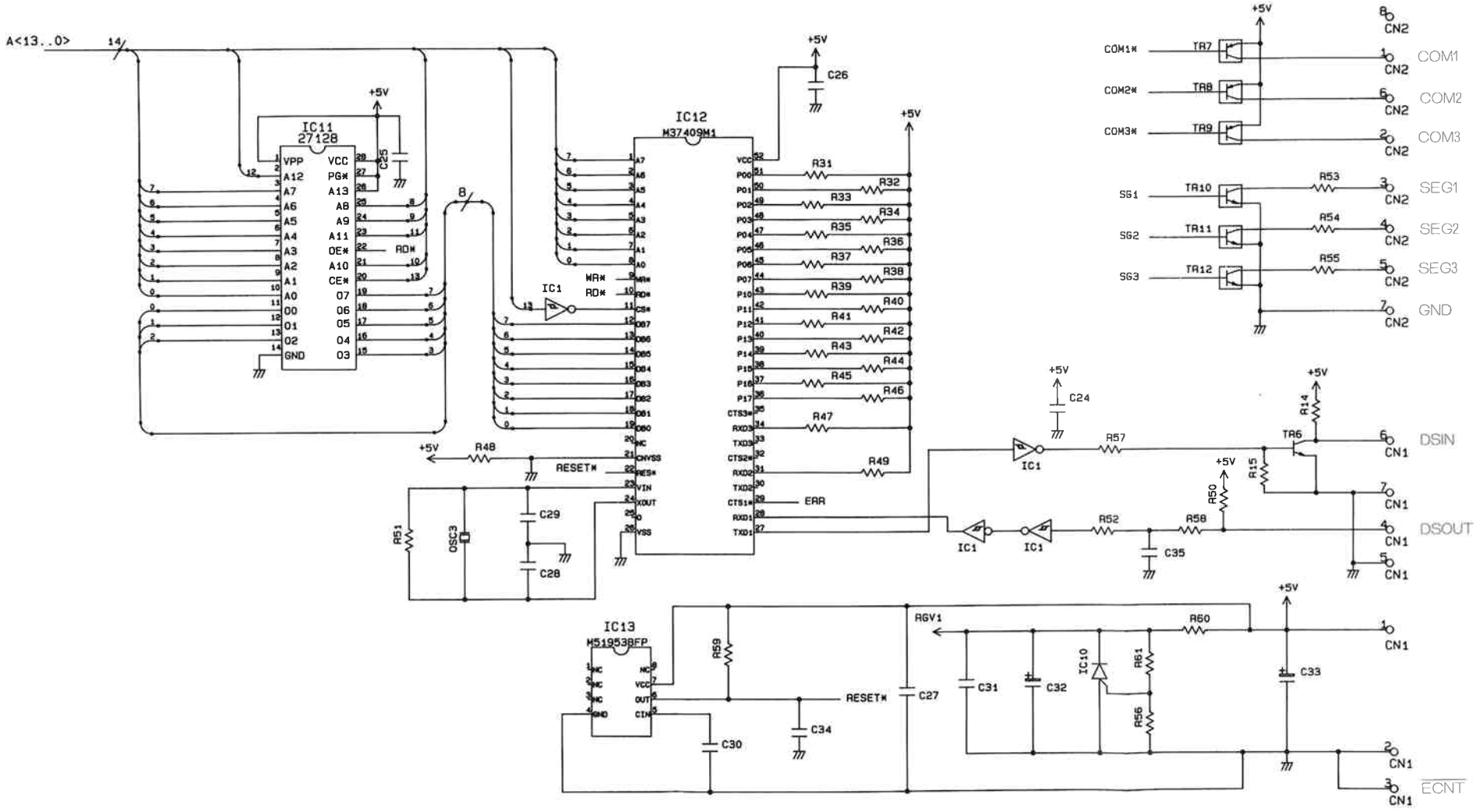

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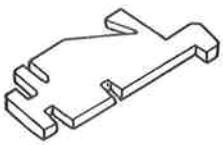
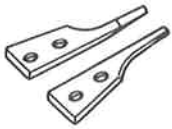
T. LIST OF SPECIAL TOOLS

Special tools which are required for servicing the copying machine (in addition to the standard tool set) are listed below.

No.	Tool name	Tool No.	Shape	Code	Application/remarks
1	Door switch actuator	TKN-0093		A	
2	Spring scale (compression)	CK-0054		B	• Measuring cassette spring strength • Adjusting scanner drive cable tension
3	Extension blades for pliers	CK-0426		B	Removing grip rings: 4 – 9 mm
4	Cleaning oil	TKN-0464		A	

Note: Rank
A: Each serviceman should carry one with him.
B: A group of five servicemen should share one.
C: Each workshop should keep one.

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U. LIST OF SOLVENTS AND MATERIALS

No.	Name	Use	Chemical formula, mixture ratio, etc.	Source	Remarks
1.	Ethyl alcohol (Ethanol) Isopropyl alcohol (Isopropanol)	Cleaning copyboard, glass, mirror, etc.	C_2H_5OH $(CHZ_3)_2$ CHOH	Locally	Flammable. Use in a well-ventilated area. Avoid breathing concentrated vapor.
2.	MEK	Removing toner or oil stains	$CH_3 \cdot CO \cdot C_2H_5$ Methylethyl ketone	Locally	Flammable. Use in a well-ventilated area. Avoid breathing concentrated vapor. Avoid contact with eyes or skin. Do not use for cleaning the drum, molded plastic parts, or corona wires.
3.	Heat-resistant grease	Lubricating the drive mechanisms; e.g., copyboard driving gear, fixing drive gear, fixing ass'y, etc.		CANON	Tool No.: CK-0427 (500g/can) (Equivalent grease can be used, but should be able to withstand 200°C for extended periods of time.)
4.	Lubricating oil (low viscosity)	Lubrication points: Scanner rail, etc.		Locally	Tool No.: CK-0451 (100cc) Equivalent oil can be used: ISO VG 68 Oil ESSO Febis K68 MOBIL Vactraoil No. 2 SHELL Tonna Oil T68
5.	Lubricating oil (low viscosity)	Lubrication point: One-way clutch in pick-up control unit		Locally	Tool No.: CK-0524 (100cc) Equivalent oil can be used: ISO VG 220 Oil ESSO Febis K220 MOBIL Vactraoil No. 4

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OFFICE IMAGING PRODUCTS TECHNICAL SUPPORT DIV.
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